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## (I) GENERAL PRINCIPLES OF PHARMACOLOGY

**PART I PHARMACOKINETICS**

001. Pharmacokinetics is:

- The study of biological and therapeutic effects of drugs
- The study of absorption, distribution, metabolism and excretion of drugs**
- The study of mechanisms of drug action
- The study of methods of new drug development

002. What does "pharmacokinetics" include?

- Complications of drug therapy
- Drug biotransformation in the organism**
- Influence of drugs on metabolism processes
- Influence of drugs on genes

002. What does "pharmacokinetics" include?

- Pharmacological effects of drugs
- Unwanted effects of drugs
- Chemical structure of a medicinal agent
- Distribution of drugs in the organism**

003. What does "pharmacokinetics" include?

- Localization of drug action
- Mechanisms of drug action
- Excretion of substances**
- Interaction of substances

004. The main mechanism of most drugs absorption in GI tract is:

- Active transport (carrier-mediated diffusion)
- Filtration (aqueous diffusion)
- Endocytosis and exocytosis
- Passive diffusion (lipid diffusion)**

005. What kind of substances can't permeate membranes by passive diffusion?

- Lipid-soluble
- Non-ionized substances
- Hydrophobic substances
- Hydrophilic substances**

006. A hydrophilic medicinal agent has the following property:

- Low ability to penetrate through the cell membrane lipids**
- Penetrate through membranes by means of endocytosis
- Easy permeation through the blood-brain barrier
- High reabsorption in renal tubules

007. What is implied by «active transport»?

- Transport of drugs through a membrane by means of diffusion
- Transport without energy consumption
- Engulf of drug by a cell membrane with a new vesicle formation
- Transport against concentration gradient**

008. What does the term "bioavailability" mean?

- Plasma protein binding degree of substance
- Permeability through the brain-blood barrier
- Fraction of an uncharged drug reaching the systemic circulation following any route administration**
- Amount of a substance in urine relative to the initial dose

009. The reasons determining bioavailability are:

- Rheological parameters of blood
- Amount of a substance obtained orally and quantity of intakes
- Extent of absorption and hepatic first-pass effect**
- Glomerular filtration rate

010. Pick out the appropriate alimentary route of administration when passage of drugs through liver is minimized:

- Oral
- Transdermal
- Rectal**
- Intraduodenal

011. Which route of drug administration is most likely to lead to the first-pass effect?

- Sublingual

**b) Oral**  
 c) Intravenous  
 d) Intramuscular

**012.** What is characteristic of the oral route?  
 a) Fast onset of effect  
**b) Absorption depends on GI tract secretion and motor function**  
 c) A drug reaches the blood passing the liver  
 d) The sterilization of medicinal forms is obligatory

**013.** Tick the feature of the sublingual route:  
**a) Pretty fast absorption**  
 b) A drug is exposed to gastric secretion  
 c) A drug is exposed more prominent liver metabolism  
 d) A drug can be administrated in a variety of doses

**014.** Pick out the parenteral route of medicinal agent administration:  
 a) Rectal  
 b) Oral  
 c) Sublingual  
**d) Inhalation**

**015.** Parenteral administration:  
 a) Cannot be used with unconsciousness patients  
 b) Generally results in a less accurate dosage than oral administration  
**c) Usually produces a more rapid response than oral administration**  
 d) Is too slow for emergency use

**016.** What is characteristic of the intramuscular route of drug administration?  
 a) Only water solutions can be injected  
**b) Oily solutions can be injected**  
 c) Opportunity of hypertonic solution injections  
 d) The action develops slower, than at oral administration

**017.** Intravenous injections are more suitable for oily solutions:  
 a) True  
**b) False**

**018.** Correct statements listing characteristics of a particular route of drug administration include all of the following EXCEPT:  
 a) Intravenous administration provides a rapid response  
 b) Intramuscular administration requires a sterile technique  
**c) Inhalation provides slow access to the general circulation**  
 d) Subcutaneous administration may cause local irritation

**019.** Most of drugs are distributed homogeneously.  
 a) True  
**b) False**

**020.** Biological barriers include all except:  
**a) Renal tubules**  
 b) Cell membranes  
 c) Capillary walls  
 d) Placenta

**021.** What is the reason of complicated penetration of some drugs through brain-blood barrier?  
 a) High lipid solubility of a drug  
 b) Meningitis  
**c) Absence of pores in the brain capillary endothelium**  
 d) High endocytosis degree in a brain capillary

**022.** The volume of distribution (Vd) relates:  
 a) Single to a daily dose of an administrated drug  
 b) An administrated dose to a body weight  
 c) An uncharged drug reaching the systemic circulation  
**d) The amount of a drug in the body to the concentration of a drug in plasma**

**023.** For the calculation of the volume of distribution (Vd) one must take into account:  
**a) Concentration of a substance in plasma**  
 b) Concentration of substance in urine  
 c) Therapeutical width of drug action  
 d) A daily dose of drug

**024.** A small amount of the volume of distribution is common for lipophylic substances easy penetrating through barriers and widely distributing in plasma, interstitial and cell fluids:

a) True  
**b) False**

025. The term "biotransformation" includes the following:  
 a) Accumulation of substances in a fat tissue  
 b) Binding of substances with plasma proteins  
 c) Accumulation of substances in a tissue  
**d) Process of physicochemical and biochemical alteration of a drug in the body**

026. Biotransformation of the drugs is to render them:  
 a) Less ionized  
 b) More pharmacologically active  
 c) More lipid soluble  
**d) Less lipid soluble**

027. Tick the drug type for which microsomal oxidation is the most prominent:  
**a) Lipid soluble**  
 b) Water soluble  
 c) Low molecular weight  
 d) High molecular weight

028. Pick out the right statement:  
 a) Microsomal oxidation always results in inactivation of a compound  
 b) Microsomal oxidation results in a decrease of compound toxicity  
**c) Microsomal oxidation results in an increase of ionization and water solubility of a drug**  
 d) Microsomal oxidation results in an increase of lipid solubility of a drug thus its excretion from the organism is facilitated

029. Stimulation of liver microsomal enzymes can:  
**a) Require the dose increase of some drugs**  
 b) Require the dose decrease of some drugs  
 c) Prolong the duration of the action of a drug  
 d) Intensify the unwanted reaction of a drug

030. Metabolic transformation (phase 1) is:  
 a) Acetylation and methylation of substances  
**b) Transformation of substances due to oxidation, reduction or hydrolysis**  
 c) Glucuronide formation  
 d) Binding to plasma proteins

031. Biotransformation of a medicinal substance results in:  
**a) Faster urinary excretion**  
 b) Slower urinary excretion  
 c) Easier distribution in organism  
 d) Higher binding to membranes

032. Conjugation is:  
 a) Process of drug reduction by special enzymes  
 b) Process of drug oxidation by special oxidases  
**c) Coupling of a drug with an endogenous substrate**  
 d) Solubilization in lipids

033. Which of the following processes proceeds in the second phase of biotransformation?  
**a) Acetylation**  
 b) Reduction  
 c) Oxidation  
 d) Hydrolysis

034. Conjugation of a drug includes the following EXCEPT:  
 a) Glucuronidation  
 b) Sulfate formation  
**c) Hydrolysis**  
 d) Methylation

035. Metabolic transformation and conjugation usually results in an increase of a substance biological activity:  
 a) True  
**b) False**

036. In case of liver disorders accompanied by a decline in microsomal enzyme activity the duration of action of some drugs is:  
 a) Decreased  
**b) Enlarged**  
 c) Remained unchanged  
 d) Changed insignificantly

037. Half life ( $t_{1/2}$ ) is the time required to:

- a) **Change the amount of a drug in plasma by half during elimination**
- b) Metabolize a half of an introduced drug into the active metabolite
- c) Absorb a half of an introduced drug
- d) Bind a half of an introduced drug to plasma proteins

038. Half life ( $t_{1/2}$ ) doesn't depend on:

- a) Biotransformation
- b) **Time of drug absorption**
- c) Concentration of a drug in plasma
- d) Rate of drug elimination

039. Elimination is expressed as follows:

- a) Rate of renal tubular reabsorption
- b) Clearance speed of some volume of blood from substance
- c) Time required to decrease the amount of drug in plasma by one-half
- d) **Clearance of an organism from a xenobiotic**

040. Elimination rate constant ( $K_{\text{elim}}$ ) is defined by the following parameter:

- a) Rate of absorption
- b) Maximal concentration of a substance in plasma
- c) Highest single dose
- d) **Half life ( $t_{1/2}$ )**

041. The most rapid eliminated drugs are those with high glomerular filtration rate and actively secreted but aren't passively reabsorbed:

- a) **True**
- b) False

042. Systemic clearance ( $CL_s$ ) is related with:

- a) Only the concentration of substances in plasma
- b) Only the elimination rate constant
- c) **Volume of distribution, half life and elimination rate constant**
- d) Bioavailability and half life

## PART II PHARMACODYNAMICS

001. Pharmacodynamics involves the study of following EXCEPT:

- a) Biological and therapeutic effects of drugs
- b) **Absorption and distribution of drugs**
- c) Mechanisms of drug action
- d) Drug interactions

002. Pharmacodynamics involves the study of following?

- a) **Mechanisms of drug action**
- b) Biotransformation of drugs in the organism
- c) Distribution of drugs in the organism
- d) Excretion of drug from the organism

003. Pharmacodynamics involves the following?

- a) Information about main mechanisms of drug absorption
- b) **Information about unwanted effects**
- c) Information about biological barriers
- d) Information about excretion of a drug from the organism

004. Pick out the answer which is the most appropriate to the term "receptor"

- a) All types of ion channels modulated by a drug
- b) Enzymes of oxidizing-reducing reactions activated by a drug
- c) **Active macromolecular components of a cell or an organism which a drug molecule has to combine with in order to elicit its specific effect**
- d) Carriers activated by a drug

005. What does "affinity" mean?

- a) A measure of how tightly a drug binds to plasma proteins
- b) **A measure of how tightly a drug binds to a receptor**
- c) A measure of inhibiting potency of a drug
- d) A measure of bioavailability of a drug

006. Target proteins which a drug molecule binds are:

- a) Only receptors
- b) Only ion channels
- c) Only carriers

**d) All of the above****007.** An agonist is a substance that:

- a) Interacts with the receptor without producing any effect
- b) Interacts with the receptor and initiates changes in cell function, producing various effects**
- c) Increases concentration of another substance to produce effect
- d) Interacts with plasma proteins and doesn't produce any effect

**008.** If an agonist can produce maximal effects and has high efficacy it's called:

- a) Partial agonist
- b) Antagonist
- c) Agonist-antagonist
- d) Full agonist**

**009.** If an agonist can produce submaximal effects and has moderate efficacy it's called:

- a) Partial agonist**
- b) Antagonist
- c) Agonist-antagonist
- d) Full agonist

**010.** An antagonist is a substance that:

- a) Binds to the receptors and initiates changes in cell function, producing maximal effect
- b) Binds to the receptors and initiates changes in cell function, producing submaximal effect
- c) Interacts with plasma proteins and doesn't produce any effect
- d) Binds to the receptors without directly altering their functions**

**011.** A competitive antagonist is a substance that:

- a) Interacts with receptors and produces submaximal effect
- b) Binds to the same receptor site and progressively inhibits the agonist response**
- c) Binds to the nonspecific sites of tissue
- d) Binds to one receptor subtype as an agonist and to another as an antagonist

**012.** The substance binding to one receptor subtype as an agonist and to another as an antagonist is called:

- a) Competitive antagonist
- b) Irreversible antagonist
- c) Agonist-antagonist**
- d) Partial agonist

**013.** Irreversible interaction of an antagonist with a receptor is due to:

- a) Ionic bonds
- b) Hydrogen bonds
- c) Covalent bonds**
- d) All of the above

**014.** Mechanisms of transmembrane signaling are the following EXCEPT:

- a) Transmembrane receptors that bind and stimulate a protein tyrosine kinase
- b) Gene replacement by the introduction of a therapeutic gene to correct a genetic effect**
- c) Ligand-gated ion channels that can be induced to open or close by binding a ligand
- d) Transmembrane receptor protein that stimulates a GTP-binding signal transducer protein (G-protein) which in turn generates an intracellular second messenger

**015.** Tick the second messenger of G-protein-coupled (metabotropic) receptor:

- a) Adenyllyl cyclase
- b) Sodium ions
- c) Phospholipase C
- d) cAMP**

**016.** Tick the substance which changes the activity of an effector element but doesn't belong to second messengers:

- a) cAMP
- b) cGMP
- c) G-protein**
- d) Calcium ions

**017.** The increase of second messengers' (cAMP, cGMP,  $\text{Ca}^{2+}$  etc.) concentration leads to:

- a) Inhibition of intracellular protein kinases and protein phosphorylation
- b) Proteinkinases activation and protein phosphorylation**
- c) Blocking of interaction between a receptor and an effector
- d) Antagonism with endogenous ligands

**018.** Tick the substances whose mechanisms are based on interaction with ion channels

- a) Sodium channel blockers
- b) Calcium channel blockers
- c) Potassium channels activators

**d) All of the above****019.** All of the following statements about efficacy and potency are true EXCEPT:

- a) Efficacy is usually a more important clinical consideration than potency
- b) Efficacy is the maximum effect of a drug
- c) Potency is a comparative measure, refers to the different doses of two drugs that are needed to produce the same effect

**d) The ED<sub>50</sub> is a measure of drug's efficacy****020.** Give the definition for a therapeutical dose:

- a) The amount of a substance to produce the minimal biological effect
- b) The amount of a substance to produce effects hazardous for an organism
- c) **The amount of a substance to produce the required effect in most patients**
- d) The amount of a substance to accelerate an increase of concentration of medicine in an organism

**021.** Pick out the correct definition of a toxic dose:

- a) The amount of substance to produce the minimal biological effect
- b) **The amount of substance to produce effects hazardous for an organism**
- c) The amount of substance to produce the necessary effect in most of patients
- d) The amount of substance to fast creation of high concentration of medicine in an organism

**022.** Which effect may lead to toxic reactions when a drug is taken continuously or repeatedly?

- a) Refractoriness
- b) **Cumulative effect**
- c) Tolerance
- d) Tachyphylaxis

**023.** What term is used to describe a more gradual decrease in responsiveness to a drug, taking days or weeks to develop?

- a) Refractoriness
- b) Cumulative effect
- c) **Tolerance**
- d) Tachyphylaxis

**024.** What term is used to describe a decrease in responsiveness to a drug which develops in a few minutes?

- a) Refractoriness
- b) Cumulative effect
- c) Tolerance
- d) **Tachyphylaxis**

**025.** Tachyphylaxis is:

- a) A drug interaction between two similar types of drugs
- b) **Very rapidly developing tolerance**
- c) A decrease in responsiveness to a drug, taking days or weeks to develop
- d) None of the above

**026.** Drug resistance is a term used to describe the loss of effectiveness of antimicrobial or antitumour drugs. This consideration is:

- a) **True**
- b) False

**027.** Tolerance and drug resistance can be a consequence of:

- a) Drug dependence
- b) **Increased metabolic degradation**
- c) Depressed renal drug excretion
- d) Activation of a drug after hepatic first-pass

**028.** Tolerance and drug resistance can be a consequence of:

- a) **Change in receptors, loss of them or exhaustion of mediators**
- b) Increased receptor sensitivity
- c) Decreased metabolic degradation
- d) Decreased renal tubular secretion

**029.** Tolerance develops because of:

- a) Diminished absorption
- b) Rapid excretion of a drug
- c) Both of the above
- d) **None of the above**

**030.** Dependence is often associated with tolerance to a drug, a physical abstinence syndrome, and psychological dependence (craving). This consideration is:

- a) **True**
- b) False

031. The situation when failure to continue administering the drug results in serious psychological and somatic disturbances is called?

- Tachyphylaxis
- Sensibilization
- Abstinence syndrome**
- Idiosyncrasy

032. What is the type of drug-to-drug interaction which is connected with processes of absorption, biotransformation, distribution and excretion?

- Pharmacodynamic interaction
- Physical and chemical interaction
- Pharmaceutical interaction
- Pharmacokinetic interaction**

033. What is the type of drug-to-drug interaction which is the result of interaction at receptor, cell, enzyme or organ level?

- Pharmacodynamic interaction**
- Physical and chemical interaction
- Pharmaceutical interaction
- Pharmacokinetic interaction

034. What phenomenon can occur in case of using a combination of drugs?

- Tolerance
- Tachyphylaxis
- Accumulation
- Synergism**

035. If two drugs with the same effect, taken together, produce an effect that is equal in magnitude to the sum of the effects of the drugs given individually, it is called as:

- Antagonism
- Potentiation
- Additive effect**
- None of the above

036. What does the term “potentiation” mean?

- Cumulative ability of a drug
- Hypersensitivity to a drug
- Fast tolerance developing
- Intensive increase of drug effects due to their combination**

037. The types of antagonism are:

- Summarized
- Potentiated
- Additive
- Competitive**

038. The term “chemical antagonism” means that:

- two drugs combine with one another to form an inactive compound**
- two drugs combine with one another to form a more active compound
- two drugs combine with one another to form a more water soluble compound
- two drugs combine with one another to form a more fat soluble compound

039. A teratogenic action is:

- Toxic action on the liver
- Negative action on the fetus causing fetal malformation**
- Toxic action on blood system
- Toxic action on kidneys

040. Characteristic unwanted reaction which isn't related to a dose or to a pharmacodynamic property of a drug is called:

- Idiosyncrasy
- Hypersensitivity**
- Tolerance
- Teratogenic action

041. Idiosyncratic reaction of a drug is:

- A type of hypersensitivity reaction
- A type of drug antagonism
- Unpredictable, inherent, qualitatively abnormal reaction to a drug**
- Quantitatively exaggerated response

042. Therapeutic index (TI) is:

- A ratio used to evaluate the safety and usefulness of a drug for indication**
- A ratio used to evaluate the effectiveness of a drug

- c) A ratio used to evaluate the bioavailability of a drug
- d) A ratio used to evaluate the elimination of a drug

(2) AGENTS, CONTROLLING THE FUNCTIONS OF THE PERIPHERAL NERVOUS SYSTEM

**PART I Local anesthetics**

001. Local anesthetics produce:

- a) Analgesia, amnesia, loss of consciousness
- b) Blocking pain sensation without loss of consciousness**
- c) Alleviation of anxiety and pain with an altered level of consciousness
- d) A stupor or somnolent state

002. A good local anesthetic agent shouldn't cause:

- a) Local irritation and tissue damage
- b) Systemic toxicity
- c) Fast onset and long duration of action**
- d) Vasodilatation

003. Most local anesthetic agents consist of:

- a) Lipophylic group (frequently an aromatic ring)
- b) Intermediate chain (commonly including an ester or amide)
- c) Amino group
- d) All of the above**

004. Which one of the following groups is responsible for the duration of the local anesthetic action?

- a) Intermediate chain**
- b) Lipophylic group
- c) Ionizable group
- d) All of the above

005. Indicate the local anesthetic agent, which has a shorter duration of action:

- a) Lidocaine
- b) Procaine**
- c) Bupivacaine
- d) Ropivacaine

006. Which one of the following groups is responsible for the potency and the toxicity of local anesthetics?

- a) Ionizable group
- b) Intermediate chain
- c) Lipophylic group**
- d) All of the above

007. Indicate the drug, which has greater potency of the local anesthetic action:

- a) Lidocaine
- b) Bupivacaine**
- c) Procaine
- d) Mepivacaine

008. Ionizable group is responsible for:

- a) The potency and the toxicity
- b) The duration of action
- c) The ability to diffuse to the site of action**
- d) All of the above

009. Which one of the following local anesthetics is an ester of benzoic acid?

- a) Lidocaine
- b) Procaine
- c) Ropivacaine
- d) Cocaine**

010. Indicate the local anesthetic, which is an ester of paraaminobenzoic acid:

- a) Mepivacaine
- b) Cocaine
- c) Procaine**
- d) Lidocaine

011. Which of the following local anesthetics is an acetanilide derivative?

- a) Tetracaine
- b) Lidocaine**
- c) Cocaine
- d) Procaine

012. Indicate the local anesthetic, which is a toluidine derivative:

- a) Lidocaine
- b) Bupivacaine
- c) Prilocaine**
- d) Procaine

013. Which of the following local anesthetics is a thiophene derivative?

- a) Procaine
- b) Ultracaine**
- c) Lidocaine
- d) Mepivacaine

014. Local anesthetics are:

- a) Weak bases**
- b) Weak acids
- c) Salts
- d) None of the above

015. For therapeutic application local anesthetics are usually made available as salts for the reasons of:

- a) Less toxicity and higher potency
- b) Higher stability and greater lipid solubility
- c) Less local tissue damage and more potency
- d) More stability and greater water solubility**

016. Which of the following statements is not correct for local anesthetics?

- a) In a tissue they exist either as an uncharged base or as a cation
- b) A charged cationic form penetrates biologic membranes more readily than an uncharged form**
- c) Local anesthetics are much less effective in inflamed tissues
- d) Low pH in inflamed tissues decreases the dissociation of nonionized molecules

017. Which one of the following statements about the metabolism of local anesthetics is incorrect?

- a) Metabolism of local anesthetics occurs at the site of administration**
- b) Metabolism occurs in the plasma or liver but not at the site of administration
- c) Ester group of anesthetics like procaine, are metabolized systemically by pseudocholinesterase
- d) Amides such as lidocaine, are metabolized in the liver by microsomal mixed function oxidases

018. Indicate the anesthetic agent of choice in patient with a liver disease:

- a) Lidocaine
- b) Bupivacaine
- c) Procaine**
- d) Etidocaine

019. Which of the following local anesthetics is preferable in patient with pseudocholinesterase deficiency?

- a) Procaine
- b) Ropivacaine**
- c) Tetracaine
- d) Benzocaine

020. The primary mechanism of action of local anesthetics is:

- a) Activation of ligand-gated potassium channels
- b) Blockade of voltage-gated sodium channels**
- c) Stimulation of voltage-gated N-type calcium channels
- d) Blockade the GABA-gated chloride channels

021. Which of the following local anesthetics is more water-soluble?

- a) Tetracaine
- b) Etidocaine
- c) Procaine**
- d) Bupivacaine

022. Indicate the local anesthetic, which is more lipid-soluble:

- a) Bupivacaine**
- b) Lidocaine
- c) Mepivacaine
- d) Procaine

023. The more lipophilic drugs:

- a) Are more potent
- b) Have longer duration of action
- c) Bind more extensively to proteins
- d) All of the above**

024. Which of the following fibers is the first to be blocked?

- a) Type A alpha fibers
- b) B and C fibers**
- c) Type A beta fibers
- d) Type A gamma fibers

025. Indicate the function, which the last to be blocked:

- a) Pain, temperature
- b) Muscle spindles
- c) Motor function**
- d) Touch, pressure

026. Which of the following fibers participates in high-frequency pain transmission?

- a) Type A delta and C fibers**
- b) Type A alpha fibers
- c) Type B fibers
- d) Type A beta fibers

027. Which of the following local anesthetics is an useful antiarrhythmic agent?

- a) Cocaine
- b) Lidocaine**
- c) Bupivacaine
- d) Ropivacaine

028. Indicate the route of local anesthetic administration, which is associated with instillation within epidural or subarachnoid spaces:

- a) Topical anesthesia
- b) Infiltrative anesthesia
- c) Regional anesthesia
- d) Spinal anesthesia**

029. The choice of a local anesthetic for specific procedures is usually based on:

- a) The duration of action
- b) Water solubility
- c) Capability of rapid penetration through the skin or mucosa with limited tendency to diffuse away from the site of application
- d) All of the above**

030. Which of the following local anesthetics is a short-acting drug?

- a) Procaine**
- b) Tetracaine
- c) Bupivacaine
- d) Ropivacaine

031. Indicate the local anesthetic, which is a long-acting agent:

- a) Lidocaine
- b) Bupivacaine**
- c) Procaine
- d) Mepivacaine

032. The anesthetic effect of the agents of short and intermediate duration of action can not be prolonged by adding:

- a) Epinephrine
- b) Norepinephrine
- c) Dopamine**
- d) Phenylephrine

033. A vasoconstrictor does not:

- a) Retard the removal of drug from the injection site
- b) Hence the chance of toxicity
- c) Decrease the blood level
- d) Reduce a local anesthetic uptake by the nerve**

034. Vasoconstrictors are less effective in prolonging anesthetic properties of:

- a) Procaine
- b) Bupivacaine**
- c) Lidocaine
- d) Mepivacaine

035. Which of the following local anesthetics is only used for surface or topical anesthesia?

- a) Cocaine**
- b) Tetracaine
- c) Procaine
- d) Bupivacaine

036. Indicate the local anesthetic, which is mainly used for regional nerve block anesthesia:

- a) Dibucaine
- b) Bupivacaine**
- c) Tetracaine
- d) Cocaine

037. Which of the following local anesthetics is used for infiltrative and regional anesthesia?

- a) Procaine
- b) Lidocaine
- c) Mepivacaine
- d) All of the above**

038. Indicate the local anesthetic, which is used for spinal anesthesia:

- a) Tetracaine**
- b) Cocaine
- c) Dibucaine
- d) Bupivacaine

039. Which of the following local anesthetics is called a universal anesthetic?

- a) Procaine
- b) Ropivacaine
- c) Lidocaine**
- d) Bupivacaine

040. Most serious toxic reaction to local anesthetics is:

- a) Seizures
- b) Cardiovascular collapse
- c) Respiratory failure
- d) All of the above**

041. Correct statements concerning cocaine include all of the following EXCEPT:

- a) Cocaine is often used for nose and throat procedures
- b) Limited use because of abuse potential
- c) Myocardial depression and peripheral vasodilatation**
- d) Causes sympathetically mediated tachycardia and vasoconstriction

042. Which of the following local anesthetics is more cardiotoxic?

- a) Procaine
- b) Bupivacaine**
- c) Lidocaine
- d) Mepivacaine

043. Most local anesthetics can cause:

- a) Depression of abnormal cardiac pacemaker activity, excitability, conduction
- b) Depression of the strength of cardiac contraction
- c) Cardiovascular collapse
- d) All of the above**

044. Which one of the following local anesthetics causes methemoglobinemia?

- a) Prilocaine**
- b) Procaine
- c) Lidocaine
- d) Ropivacaine

045. Procaine has all of the following properties EXCEPT:

- a) It has ester linkage
- b) Its metabolic product can inhibit the action of sulfonamides
- c) It readily penetrates the skin and mucosa**
- d) It is relatively short-acting

046. Correct statements concerning lidocaine include all of the following EXCEPT:

- a) It is an universal anesthetic
- b) It has esteratic linkage**
- c) It widely used as an antiarrhythmic agent
- d) It is metabolized in liver

047. Which of the following local anesthetics is more likely to cause allergic reactions?

- a) Lidocaine
- b) Bupivacaine
- c) Procaine**
- d) Ropivacaine

048. Tetracaine has all of the following properties EXCEPT:

- a) Slow onset
- b) Low potency**
- c) Long duration
- d) High toxicity

049. Correct statements concerning bupivacaine include all of the following EXCEPT:

- a) It has low cardiototoxicity**
- b) It has amide linkage
- c) It is a long-acting drug
- d) An intravenous injection can lead to seizures

#### **PART II Cholinomimetic drugs**

001. Acetylcholine is not a specific neurotransmitter at:

- a) Sympathetic ganglia
- b) Sympathetic postganglionic nerve endings**
- c) Parasympathetic ganglia
- d) Parasympathetic postganglionic nerve endings

002. Muscarinic receptors are located in:

- a) Autonomic ganglia
- b) Skeletal muscle neuromuscular junctions
- c) Autonomic effector cells**
- d) Sensory carotid sinus baroreceptor zone

003. Indicate the location of M<sub>2</sub> cholinoreceptor type:

- a) Heart**
- b) Glands
- c) Smooth muscle
- d) Endothelium

004. The symptoms of mushroom poisoning include all of the following EXCEPT:

- a) Salivation, lacrimation, nausea, vomiting
- b) Dryness of mouth, hyperpyrexia, hallucination**
- c) Headache, abdominal colic
- d) Bradycardia, hypotension and shock

005. Which of the following cholinomimetics activates both muscarinic and nicotinic receptors?

- a) Lobeline
- b) Pilocarpine
- c) Nicotine
- d) Bethanechol**

006. Indicate a cholinomimetic agent, which is related to direct-acting drugs:

- a) Edrophonium
- b) Physostigmine
- c) Carbachol**
- d) Isoflurophate

007. Characteristics of carbachol include all of the following EXCEPT:

- a) It decreases intraocular pressure
- b) It causes mydriasis**
- c) It exerts both nicotinic and muscarinic effects
- d) It is resistant to acetylcholinesterase

008. Acetylcholine is not used in clinical practice because:

- a) It is very toxic
- b) The doses required are very high
- c) It is very rapidly hydrolyzed**
- d) It is very costly

009. Parasympathomimetic drugs cause:

- a) Bronchodilation
- b) Mydriasis
- c) Bradycardia**
- d) Constipation

010. Which of the following direct-acting cholinomimetics is mainly muscarinic in action?

- a) Bethanechol**
- b) Carbachol
- c) Acetylcholine
- d) None of the above

011. Which of the following direct-acting cholinomimetics has the shortest duration of action?

- a) **Acetylcholine**
- b) Methacholine
- c) Carbachol
- d) Bethanechol

012. Bethanechol has all of the following properties EXCEPT:

- a) It is extremely resistant to hydrolysis
- b) Purely muscarinic in its action
- c) It is used for abdominal urinary bladder distention
- d) **It exerts both nicotinic and muscarinic effects**

013. A M-cholinimimetic agent is:

- a) Carbachol
- b) **Pilocarpine**
- c) Acetylcholine
- d) Bethanechol

014. Characteristics of pilocarpine include all of the following EXCEPT:

- a) It is a tertiary amine alkaloid
- b) It causes miosis and a decrease in intraocular pressure
- c) **Causes a decrease in secretory and motor activity of gut**
- d) It is useful in the treatment of glaucoma

015. Which of the following cholinomimetics is a plant derivative with lower potency than nicotine but with a similar spectrum of action?

- a) **Lobeline**
- b) Pilocarpine
- c) Carbochol
- d) Acetylcholine

016. Which of the following cholinomimetics is indirect-acting?

- a) Lobeline
- b) **Edrophonium**
- c) Pilocarpine
- d) Carbachol

017. The mechanism of action of indirect-acting cholinomimetic agents is:

- a) Binding to and activation of muscarinic or nicotinic receptors
- b) **Inhibition of the hydrolysis of endogenous acetylcholine**
- c) Stimulation of the action of acetylcholinesterase
- d) Releasing acetylcholine from storage sites

018. Indicate a reversible cholinesterase inhibitor:

- a) Isofluorophate
- b) Carbochol
- c) **Physostigmine**
- d) Parathion

019. Which of the following cholinesterase inhibitors is irreversible?

- a) Physostigmine
- b) Edrophonium
- c) Neostigmine
- d) **Isofluorophate**

020. Indicate cholinesterase activator:

- a) **Pralidoxime**
- b) Edrophonium
- c) Pilocarpine
- d) Isofluorophate

021. Isofluorophate increases all of the following effects except:

- a) Lacrimation
- b) **Bronchodilation**
- c) Muscle twitching
- d) Salivation

022. Indicate a cholinesterase inhibitor, which has an additional direct nicotinic agonist effect:

- a) Edrophonium
- b) Carbochol
- c) **Neostigmine**
- d) Lobeline

023. Cholinesterase inhibitors do not produce:

- Bradycardia, no change or modest fall in blood pressure
- Increased strength of muscle contraction, especially in muscles weakened by myasthenia gravis
- Miosis and reduction of intraocular pressure
- Dramatic hypertension and tachycardia**

024. Which of the following cholinomimetics is commonly used in the treatment of glaucoma?

- Pilocarpine**
- Lobeline
- Acetylcholine
- Neostigmine

025. Indicate the organophosphate cholinesterase inhibitor, which can be made up in an aqueous solution for ophthalmic use and retains its activity within a week:

- Physostigmine
- Edrophonium
- Echothiophate**
- Neostigmine

026. Which of the following cholinomimetics is most widely used for paralytic ileus and atony of the urinary bladder?

- Lobeline
- Neostigmine**
- Pilocarpine
- Echothiophate

027. Chronic long-term therapy of myasthenia is usually accomplished with:

- Edrophonium
- Neostigmine**
- Echothiophate
- Carbachol

028. Which of the following cholinomimetics is a drug of choice for reversing the effects of nondepolarizing neuromuscular relaxants?

- Echothiophate
- Physostigmine
- Edrophonium**
- Pilocarpine

029. Indicate the reversible cholinesterase inhibitor, which penetrates the blood-brain barrier:

- Physostigmine**
- Edrophonium
- Neostigmine
- Piridostigmine

030. Which of the following cholinomimetics is used in the treatment of atropine intoxication?

- Neostigmine
- Carbochol
- Physostigmine**
- Lobeline

031. The symptoms of excessive stimulation of muscarinic receptors include all of the following EXCEPT:

- Abdominal cramps, diarrhea
- Increased salivation, excessive bronchial secretion
- Miosis, bradycardia
- Weakness of all skeletal muscles**

032. The excessive stimulation of muscarinic receptors by pilocarpine and choline esters is blocked competitively by:

- Edrophonium
- Atropine**
- Pralidoxime
- Echothiophate

033. The toxic effects of a large dose of nicotine include all of the following EXCEPT:

- Hypotension and bradycardia**
- Convulsions, coma and respiratory arrest
- Skeletal muscle depolarization blockade and respiratory paralysis
- Hypertension and cardiac arrhythmias

034. The dominant initial signs of acute cholinesterase inhibitors intoxication include all of the following except:

- Salivation, sweating
- Mydriasis**
- Bronchial constriction

d) Vomiting and diarrhea

035. Which of the following drugs is used for acute toxic effects of organophosphate cholinesterase inhibitors?

- Atropine
- Pilocarpine
- Pralidoxime**
- Edrophonium

**PART III Cholinoreceptor blocking drugs**

001. The group of nicotinic receptor-blocking drugs consists of:

- Ganglion-blockers
- Atropine-similar drugs
- Neuromuscular junction blockers
- Both a and c**

002. M<sub>3</sub> receptor subtype is located:

- In the myocardium
- In sympathetic postganglionic neurons
- On effector cell membranes of glandular and smooth muscle cells**
- On the motor end plates

003. Which of the following drugs is both a muscarinic and nicotinic blocker?

- Atropine
- Benztropine**
- Hexamethonium
- Succinylcholine

004. Indicate a muscarinic receptor-blocking drug:

- Scopolamine**
- Pipecuronium
- Trimethaphan
- Pilocarpine

005. Which of the following agents is a ganglion-blocking drug?

- Homatropine
- Hexamethonium**
- Rapacuronium
- Edrophonium

006. Indicate the skeletal muscle relaxant, which is a depolarizing agent:

- Vencuronium
- Scopolamine
- Succinylcholine**
- Hexamethonium

007. Which of the following drugs is a nondepolarizing muscle relaxant?

- Pancuronium**
- Succinylcholine
- Hexamethonium
- Scopolamine

008. Indicate the drug, which is rapidly and fully distributed into CNS and has a greater effect than most other antimuscarinic agents?

- Atropine
- Scopolamine**
- Homatropine
- Ipratropium

009. The effect of the drug on parasympathetic function declines rapidly in all organs EXCEPT:

- Eye**
- Heart
- Smooth muscle organs
- Glands

010. The mechanism of atropine action is:

- Competitive ganglion blockade
- Competitive muscarinic blockade**
- Competitive neuromuscular blockade
- Noncompetitive neuromuscular blockade

011. The tissues most sensitive to atropine are:

**a) The salivary, bronchial and sweat glands**  
 b) The gastric parietal cells  
 c) Smooth muscle and autonomic effectors  
 d) The heart

**012.** Atropine is highly selective for:  
 a) M<sub>1</sub> receptor subtype  
 b) M<sub>2</sub> receptor subtype  
 c) M<sub>3</sub> receptor subtype  
**d) All of the above**

**013.** Which of the following antimuscarinic drugs is often effective in preventing or reversing vestibular disturbances, especially motion sickness?  
 a) Atropine  
 b) Ipratropium  
**c) Scopolamine**  
 d) Homatropine

**014.** Atropine causes:  
 a) Miosis, a reduction in intraocular pressure and cyclospasm  
**b) Mydriasis, a rise in intraocular pressure and cycloplegia**  
 c) Miosis, a rise in intraocular pressure and cycloplegia  
 d) Mydriasis, a rise in intraocular pressure and cyclospasm

**015.** Patients complain of dry or "sandy" eyes when receiving large doses of:  
**a) Atropine**  
 b) Hexamethonium  
 c) Pilocarpine  
 d) Carbachol

**016.** All of the following parts of the heart are very sensitive to muscarinic receptor blockade except:  
 a) Atria  
 b) Sinoatrial node  
 c) Atrioventricular node  
**d) Ventricle**

**017.** Atropine causes:  
 a) Bradycardia, hypotension and bronchoconstriction  
**b) Tachycardia, little effect on blood pressure and bronchodilation**  
 c) Decrease in contractile strength, conduction velocity through the AV node  
 d) Tachycardia, hypertensive crisis and bronchodilation

**018.** Atropine is frequently used prior to administration of inhalant anesthetics to reduce:  
 a) Muscle tone  
**b) Secretions**  
 c) Nausea and vomiting  
 d) All of the above

**019.** Atropine is now rarely used for the treatment of peptic ulcer because of:  
 a) Slow gastric emptying and prolongation of the exposure of the ulcer bed to acid  
 b) Low efficiency and necessity of large doses  
 c) Adverse effects  
**d) All of the above**

**020.** Which of the following antimuscarinic drugs is a selective M<sub>1</sub> blocker?  
 a) Atropine  
 b) Scopolamine  
**c) Pirenzepine**  
 d) Homatropine

**021.** Atropine causes:  
**a) Spasmolytic activity**  
 b) Intestinal hypermotility  
 c) Stimulation of contraction in the gut  
 d) Stimulation of secretory activity

**022.** Which of the following drugs is useful in the treatment of uterine spasms?  
 a) Carbachol  
 b) Vecuronium  
**c) Atropine**  
 d) Edrophonium

**023.** Atropine may cause a rise in body temperature (atropine fever):

- a) In adults
- b) In pregnant women
- c) In infants and children**
- d) All of the above

024. The pharmacologic actions of scopolamine most closely resemble those of:

- a) Hexamethonium
- b) Atropine**
- c) Succinylcholine
- d) Pilocarpine

025. Compared with atropine, scopolamine has all of the following properties EXCEPT:

- a) More marked central effect
- b) Less potent in decreasing bronchial, salivary and sweat gland secretion**
- c) More potent in producing mydriasis and cycloplegia
- d) Lower effects on the heart, bronchial muscle and intestines

026. Which of the following drugs is useful in the treatment of Parkinson's disease?

- a) Benztropine**
- b) Edrophonium
- c) Succinylcholine
- d) Hexamethonium

027. Indicate the antimuscarinic drug, which is used as a mydriatic:

- a) Pilocarpine
- b) Neostigmine
- c) Homatropine**
- d) Ipratropium

028. Which of the following agents is used as an inhalation drug in asthma?

- a) Atropine
- b) Ipratropium**
- c) Lobeline
- d) Homatropine

029. Which of the following agents is most effective in regenerating cholinesterase associated with skeletal muscle neuromuscular junctions?

- a) Succinylcholine
- b) Pralidoxime**
- c) Pirenzepine
- d) Propiverine

030. Indicate an antimuscarinic drug, which is effective in the treatment of mushroom poisoning:

- a) Pralidoxime
- b) Pilocarpine
- c) Homatropine
- d) Atropine**

031. Antimuscarinics are used in the treatment of the following disorders EXCEPT:

- a) Motion sickness
- b) Glaucoma**
- c) Hyperhidrosis
- d) Asthma

032. The atropine poisoning includes all of the following symptoms EXCEPT:

- a) Mydriasis, cycloplegia
- b) Hyperthermia, dry mouth, hot and flushed skin
- c) Agitation and delirium
- d) Bradicardia, orthostatic hypotension**

033. The treatment of the antimuscarinic effects can be carried out with:

- a) Neostigmine**
- b) Hexamethonium
- c) Homatropine
- d) Acetylcholine

034. Contraindications to the use of antimuscarinic drugs are all of the following except:

- a) Glaucoma
- b) Myasthenia
- c) Bronchial asthma**
- d) Paralytic ileus and atony of the urinary bladder

035. Hexamethonium blocks the action of acetylcholine and similar agonists at:

- a) Muscarinic receptor site
- b) Neuromuscular junction
- c) Autonomic ganglia**
- d) Axonal transmission

036. The applications of the ganglion blockers have disappeared because of all of the following reasons EXCEPT:

- a) Orthostatic hypotension
- b) Lack of selectivity
- c) Homeostatic reflexes block
- d) Respiratory depression**

037. Which of the following agents is a short-acting ganglion blocker?

- a) Homatropine
- b) Trimethaphane**
- c) Hexamethonium
- d) Pancuronium

038. Indicate the ganglion-blocking drug, which can be taken orally for the treatment of hypertension?

- a) Mecamylamine**
- b) Scopolamine
- c) Trimethaphane
- d) Vecuronium

039. The systemic effects of hexamethonium include all of the following EXCEPT:

- a) Reduction of both peripheral vascular resistance and venous return
- b) Partial mydriasis and loss of accommodation
- c) Constipation and urinary retention
- d) Stimulation of thermoregulatory sweating**

040. Ganglion blocking drugs are used for the following emergencies EXCEPT:

- a) Hypertensive crises
- b) Controlled hypotension
- c) Cardiovascular collapse**
- d) Pulmonary edema

041. Agents that produce neuromuscular blockade act by inhibiting:

- a) Interaction of acetylcholine with cholinergic receptors**
- b) Release of acetylcholine from prejunctional membrane
- c) Packaging of acetylcholine into synaptic vesicles
- d) Reuptake of acetylcholine into the nerve ending

042. Skeletal muscle relaxation and paralysis can occur from interruption of functions at several sites, including all of the following EXCEPT:

- a) Nicotinic acetylcholine receptors
- b) Muscarinic acetylcholine receptors**
- c) The motor end plate
- d) Contractile apparatus

043. Nondepolarisation neuromuscular blocking agents:

- a) Block acetylcholine reuptake
- b) Prevent access of the transmitter to its receptor and depolarization**
- c) Block transmission by an excess of a depolarizing agonist
- d) All of the above

044. Which of the following drugs has “double-acetylcholine” structure?

- a) Rocuronium
- b) Carbachol
- c) Atracurium
- d) Succylcholine**

045. Indicate the long-acting neuromuscular blocking agent:

- a) Rapacuronium
- b) Mivacurium
- c) Tubocurarine**
- d) Rocuronium

046. Which of the following neuromuscular blocking drugs is an intermediate-duration muscle relaxant?

- a) Vecuronium**
- b) Tubocurarine
- c) Pancuronium
- d) Rapacuronium

047. Indicate the nondepolarizing agent, which has the fastest onset of effect?

- a) Succinylcholine
- b) Rapacuronium**
- c) Pancuronium
- d) Tubocurarine

**048.** Indicate the neuromuscular blocker, whose breakdown product readily crosses the blood-brain barrier and may cause seizures:

- a) Pancuronium
- b) Succinylcholine
- c) Tubocurarine
- d) Atracurium**

**049.** Which competitive neuromuscular blocking agent could be used in patients with renal failure?

- a) Atracurium**
- b) Succinylcholine
- c) Pipecuronium
- d) Doxacurium

**050.** Indicate the nondepolarizing agent, which has short duration of action:

- a) Succinylcholine
- b) Tubocurarine
- c) Mivacurium**
- d) Pancuronium

**051.** Which depolarizing agent has the extremely brief duration of action?

- a) Mivacurium
- b) Rapacuronium
- c) Rocuronium
- d) Succinylcholine**

**052.** Neuromuscular blockade by both succinylcholine and mivacurium may be prolonged in patients with:

- a) Renal failure
- b) An abnormal variant of plasma cholinesterase
- c) Hepatic disease
- d) Both b and c**

**053.** Depolarizing agents include all of the following properties EXCEPT:

- a) Interact with nicotinic receptor to compete with acetylcholine without receptor activation**
- b) React with the nicotinic receptor to open the channel and cause depolarisation of the end plate
- c) Cause desensitization, noncompetitive block manifested by flaccid paralysis
- d) Cholinesterase inhibitors do not have the ability to reverse the blockade

**054.** Which of the following neuromuscular blockers causes transient muscle fasciculations?

- a) Mivacurium
- b) Pancuronium
- c) Succinylcholine**
- d) Tubocurarine

**055.** Indicate muscles, which are more resistant to block and recover more rapidly:

- a) Hand
- b) Leg
- c) Neck
- d) Diaphragm**

**056.** Which neuromuscular blocking agent has the potential to cause the greatest release of histamine?

- a) Succinylcholine
- b) Tubocurarine**
- c) Pancuronium
- d) Rocuronium

**057.** Which of the following muscular relaxants causes hypotension and bronchospasm?

- a) Vecuronium
- b) Succinylcholine
- c) Tubocurarine**
- d) Rapacuronium

**058.** Indicate the neuromuscular blocker, which causes tachycardia:

- a) Tubocurarine
- b) Atracurium
- c) Pancuronium**
- d) Succinylcholine

**059.** Which of the following neuromuscular blocking agents cause cardiac arrhythmias?

- a) Vecuronium
- b) Tubocurarine
- c) Rapacuronium
- d) Succinylcholine**

060. Effects seen only with depolarizing blockade include all of the following EXCEPT:

- a) Hypercalciemia
- b) A decrease in intraocular pressure**
- c) Emesis
- d) Muscle pain

061. Which neuromuscular blocking agent is contraindicated in patients with glaucoma?

- a) Tubocurarine
- b) Succinylcholine**
- c) Pancuronium
- d) Gallamine

062. Indicate the following neuromuscular blocker, which would be contraindicated in patients with renal failure:

- a) Pipecuronium**
- b) Succinylcholine
- c) Atracurium
- d) Rapacuronium

063. All of the following drugs increase the effects of depolarizing neuromuscular blocking agents EXCEPT:

- a) Aminoglycosides
- b) Antiarrhythmic drugs
- c) Nondepolarizing blockers**
- d) Local anesthetics

064. Which of the following diseases can augment the neuromuscular blockade produced by nondepolarizing muscle relaxants?

- a) Myasthenia gravis**
- b) Burns
- c) Asthma
- d) Parkinsonism

065. Indicate the agent, which effectively antagonizes the neuromuscular blockade caused by nondepolarizing drugs:

- a) Atropine
- b) Neostigmine**
- c) Acetylcholine
- d) Pralidoxime

#### **PART IV Adrenoreceptor activating drugs**

001. Sympathetic stimulation is mediated by:

- a) Release of norepinephrine from nerve terminals
- b) Activation of adrenoreceptors on postsynaptic sites
- c) Release of epinephrine from the adrenal medulla
- d) All of the above**

002. Characteristics of epinephrine include all of the following EXCEPT:

- a) It is synthesized into the adrenal medulla
- b) It is synthesized into the nerve ending**
- c) It is transported in the blood to target tissues
- d) It directly interacts with and activates adrenoreceptors

003. Which of the following sympathomimetics acts indirectly?

- a) Epinephrine
- b) Norepinephrine
- c) Ephedrine**
- d) Methoxamine

004. Indirect action includes all of the following properties EXCEPT:

- a) Displacement of stored catecholamines from the adrenergic nerve ending
- b) Inhibition of reuptake of catecholamines already released
- c) Interaction with adrenoreceptors**
- d) Inhibition of the release of endogenous catecholamines from peripheral adrenergic neurons

005. Catecholamine includes following EXCEPT:

- a) Ephedrine**
- b) Epinephrine
- c) Isoprenaline

d) Norepinephrine

**006.** Epinephrine decreases intracellular camp levels by acting on:

- $\alpha_1$  receptor
- $\alpha_2$  receptor**
- $\beta_1$  receptor
- $\beta_2$  receptor

**007.** Which of the following statements is not correct?

- ALFA receptors increase arterial resistance, whereas  $\beta_2$  receptor promote smooth muscle relaxation
- The skin and splanchnic vessels have predominantly alfa receptors
- Vessels in a skeletal muscle may constrict or dilate depending on whether alfa or  $\beta_2$  receptors are activated
- Skeletal muscle vessels have predominantly alfa receptors and constrict in the presence of epinephrine and norepinephrine**

**008.** Direct effects on the heart are determined largely by:

- Alfa<sub>1</sub> receptor
- Alfa<sub>2</sub> receptor
- Beta<sub>1</sub> receptor**
- Beta<sub>2</sub> receptor

**009.** Which of the following effects is related to direct beta<sub>1</sub>-adrenoreceptor stimulation?

- Bronchodilation
- Vasodilatation
- Tachycardia**
- Bradycardia

**010.** Distribution of alfa adrenoreceptor subtypes is associated with all of the following tissues except those of:

- Heart**
- Blood vessels
- Prostate
- Pupillary dilator muscle

**011.** Beta adrenoreceptor subtypes is contained in all of the following tissues EXCEPT:

- Bronchial muscles
- Heart
- Pupillary dilator muscle**
- Fat cells

**012.** In which of the following tissues both alfa and beta<sub>1</sub> adrenergic stimulation produces the same effect?

- Blood vessels
- Intestine**
- Uterus
- Bronchial muscles

**013.** The effects of sympathomimetics on blood pressure are associated with their effects on:

- The heart
- The peripheral resistance
- The venous return
- All of the above**

**014.** A relatively pure alfa agonist causes all of the following effects EXCEPT:

- Increase peripheral arterial resistance
- Increase venous return
- Has no effect on blood vessels**
- Reflex bradycardia

**015.** A nonselective beta receptor agonist causes all of the following effects EXCEPT:

- Increase cardiac output
- Increase peripheral arterial resistance**
- Decrease peripheral arterial resistance
- Decrease the mean pressure

**016.** Which of the following statement is not correct?

- Alfa agonists cause miosis**
- Alfa agonists cause mydriasis
- Beta antagonists decrease the production of aqueous humor
- Alfa agonists increase the outflow of aqueous humor from the eye

**017.** A bronchial smooth muscle contains:

- Alfa<sub>1</sub> receptor
- Alfa<sub>2</sub> receptor
- Beta<sub>1</sub> receptor**

**d) Beta<sub>2</sub> receptor**

018. All of the following agents are beta receptor agonists EXCEPT:

- a) Epinephrine
- b) Isoproterenol
- c) Methoxamine**
- d) Dobutamine

019. Which of the following drugs causes bronchodilation without significant cardiac stimulation?

- a) Isoprenaline
- b) Terbutaline**
- c) Xylometazoline
- d) Methoxamine

020. Alfa-receptor stimulation includes all of the following effects EXCEPT:

- a) Relaxation of gastrointestinal smooth muscle
- b) Contraction of bladder base, uterus and prostate
- c) Stimulation of insulin secretion**
- d) Stimulation of platelet aggregation

021. Beta<sub>1</sub> receptor stimulation includes all of the following effects EXCEPT:

- a) Increase in contractility
- b) Bronchodilation**
- c) Tachycardia
- d) Increase in conduction velocity in the atrioventricular node

022. Beta<sub>2</sub> receptor stimulation includes all of the following effects EXCEPT:

- a) Stimulation of renin secretion
- b) Fall of potassium concentration in plasma
- c) Relaxation of bladder, uterus
- d) Tachycardia**

023. Hyperglycemia induced by epinephrine is due to:

- a) Gluconeogenesis (beta<sub>2</sub>)
- b) Inhibition of insulin secretion (alfa)
- c) Stimulation of glycogenolysis (beta<sub>2</sub>)
- d) All of the above**

024. Which of the following effects is associated with beta<sub>3</sub>-receptor stimulation?

- a) Lipolysis**
- b) Decrease in platelet aggregation
- c) Bronchodilation
- d) Tachycardia

025. Which of the following statements is not correct?

- a) Epinephrine acts on both alfa- and beta-receptors
- b) Norepinephrine has a predominantly beta action**
- c) Methoxamine has a predominantly alfa action
- d) Isoprenaline has a predominantly beta action

026. Indicate the drug, which is a direct-acting both alfa- and beta-receptor agonist:

- a) Norepinephrine**
- b) Methoxamine
- c) Isoproterenol
- d) Ephedrine

027. Which of the following agents is an alfa<sub>1</sub> alfa<sub>2</sub> beta<sub>1</sub> beta<sub>2</sub> receptor agonist?

- a) Methoxamine
- b) Albuterol
- c) Epinephrine**
- d) Norepinephrine

028. Indicate the direct-acting sympathomimetic, which is an alfa<sub>1</sub> alfa<sub>2</sub> beta<sub>1</sub> receptor agonist:

- a) Isoproterenol
- b) Ephedrine
- c) Dobutamine
- d) Norepinephrine**

029. Which of the following agents is an alfa<sub>1</sub>-selective agonist?

- a) Norepinephrine
- b) Methoxamine**
- c) Ritodrine
- d) Ephedrine

030. Indicate the  $\alpha_2$ -selective agonist:

- a) **Xylometazoline**
- b) Epinephrine
- c) Dobutamine
- d) Methoxamine

031. Which of the following agents is a nonselective beta receptor agonist?

- a) Norepinephrine
- b) Terbutaline
- c) **Isoproterenol**
- d) Dobutamine

032. Indicate the  $\beta_1$ -selective agonist:

- a) Isoproterenol
- b) **Dobutamine**
- c) Metaproterenol
- d) Epinephrine

033. Which of the following sympathomimetics is a  $\beta_2$ -selective agonist?

- a) **Terbutaline**
- b) Xylometazoline
- c) Isoproterenol
- d) Dobutamine

034. Indicate the indirect-acting sympathomimetic agent:

- a) Epinephrine
- b) Phenylephrine
- c) **Ephedrine**
- d) Isoproterenol

035. Epinephrine produces all of the following effects EXCEPT:

- a) Positive inotropic and chronotropic actions on the heart ( $\beta_1$  receptor)
- b) Increase peripheral resistance ( $\alpha$  receptor)
- c) **Predominance of  $\alpha$  effects at low concentration**
- d) Skeletal muscle blood vessel dilatation ( $\beta_2$  receptor)

036. Epinephrine produces all of the following effects EXCEPT:

- a) **Decrease in oxygen consumption**
- b) Bronchodilation
- c) Hyperglycemia
- d) Mydriasis

037. Epinephrine is used in the treatment of all of the following disorders EXCEPT:

- a) Bronchospasm
- b) Anaphylactic shock
- c) **Cardiac arrhythmias**
- d) Open-angle glaucoma

038. Compared with epinephrine, norepinephrine produces all of the following effects EXCEPT:

- a) Similar effects on  $\beta_1$  receptors in the heart and similar potency at an  $\alpha$  receptor
- b) **Decrease the mean pressure below normal before returning to the control value**
- c) Significant tissue necrosis if injected subcutaneously
- d) Increase both diastolic and systolic blood pressure

039. Norepinephrine produces:

- a) **Vasoconstriction**
- b) Vasodilatation
- c) Bronchodilation
- d) Decreased potassium concentration in the plasma

040. Which of the following direct-acting drugs is a relatively pure  $\alpha$  agonist, an effective mydriatic and decongestant and can be used to raise blood pressure?

- a) Epinephrine
- b) Norepinephrine
- c) **Phenylephrine**
- d) Ephedrine

041. Characteristics of methoxamine include all of the following EXCEPT:

- a) It is a direct-acting  $\alpha_1$ -receptor agonist
- b) **It increases heart rate, contractility and cardiac output**
- c) It causes reflex bradycardia
- d) It increases total peripheral resistance

042. Which of the following agents is an alfa<sub>2</sub>-selective agonist with ability to promote constriction of the nasal mucosa?

- a) **Xylometazoline**
- b) Phenylephrine
- c) Methoxamine
- d) Epinephrine

043. Indicate the sympathomimetic, which may cause hypotension, presumably because of a clonidine-like effect:

- a) Methoxamine
- b) Phenylephrine
- c) **Xylometazoline**
- d) Isoproterenol

044. Isoproterenol is:

- a) Both an alfa- and beta-receptor agonist
- b) beta<sub>1</sub>-selective agonist
- c) beta<sub>2</sub>-selective agonist
- d) **Nonselective beta receptor agonist**

045. Isoproterenol produces all of the following effects EXCEPT:

- a) Increase in cardiac output
- b) Fall in diastolic and mean arterial pressure
- c) **Bronchoconstriction**
- d) Tachycardia

046. Characteristics of dobutamine include all of the following EXCEPT:

- a) It is a relatively beta<sub>1</sub>-selective synthetic catecholamine
- b) **It is used to treat bronchospasm**
- c) It increases atrioventricular conduction
- d) It causes minimal changes in heart rate and systolic pressure

047. Characteristics of salmeterol include all of the following EXCEPT:

- a) It is a potent selective beta<sub>2</sub> agonist
- b) It causes uterine relaxation
- c) **It stimulates heart rate, contractility and cardiac output**
- d) It is used in the therapy of asthma

048. Characteristics of ephedrine include all of the following EXCEPT:

- a) It acts primarily through the release of stored catecholamines
- b) It is a mild CNS stimulant
- c) It causes tachyphylaxis with repeated administration
- d) **It decreases arterial pressure**

049. Ephedrine causes:

- a) Miosis
- b) **Bronchodilation**
- c) Hypotension
- d) Bradycardia

050. Compared with epinephrine, ephedrine produces all of the following features EXCEPT:

- a) **It is a direct-acting sympathomimetic**
- b) It has oral activity
- c) It is resistant to MAO and has much longer duration of action
- d) Its effects are similar, but it is less potent

051. Which of the following sympathomimetics is preferable for the treatment of chronic orthostatic hypotension?

- a) Epinephrine
- b) Norepinephrine
- c) **Ephedrine**
- d) Salmeterol

052. Indicate the sympathomimetic drug, which is used in a hypotensive emergency:

- a) Xylometazoline
- b) Ephedrine
- c) Terbutaline
- d) **Phenylephrine**

053. Which of the following sympathomimetics is preferable for the emergency therapy of cardiogenic shock?

- a) Epinephrine
- b) **Dobutamine**
- c) Isoproterenol
- d) Methoxamine

054. Indicate the sympathomimetic agent, which is combined with a local anesthetic to prolong the duration of infiltration nerve block:

- Epinephrine**
- Xylometazoline
- Isoproterenol
- Dobutamine

055. Which of the following sympathomimetics is related to short-acting topical decongestant agents?

- Xylometazoline
- Terbutaline
- Phenylephrine**
- Norepinephrine

056. Indicate the long-acting topical decongestant agents:

- Epinephrine
- Norepinephrine
- Phenylephrine
- Xylometazoline**

057. Which of the following topical decongestant agents is an  $\alpha_2$ -selective agonist?

- Phenylephrine
- Xylometazoline**
- Ephedrine
- Epinephrine

058. Indicate the sympathomimetic, which may be useful in the emergency management of cardiac arrest:

- Methoxamine
- Phenylephrine
- Epinephrine**
- Xylometazoline

059. Which of the following sympathomimetics is used in the therapy of bronchial asthma?

- Formoterol
- Norepinephrine
- Methoxamine
- Dobutamine

060. Indicate the agent of choice in the emergency therapy of anaphylactic shock:

- Methoxamine
- Terbutaline
- Norepinephrine
- Epinephrine**

061. Which of the following sympathomimetics is an effective mydriatic?

- Salmeterol
- Phenylephrine**
- Dobutamine
- Norepinephrine

062. The adverse effects of sympathomimetics include all of the following EXCEPT:

- Drug-induced parkinsonism**
- Cerebral hemorrhage or pulmonary edema
- Myocardial infarction
- Ventricular arrhythmias

#### **PART V Adrenoreceptor antagonist drugs**

001. Which of the following drugs is a nonselective  $\alpha$  receptor antagonist?

- Prazosin
- Phentolamine**
- Metoprolol
- Reserpine

002. Indicate the  $\alpha_1$ -selective antagonist:

- Phentolamine
- Dihydroergotamine
- Prazosin**
- Labetalol

003. Which of the following agents is an  $\alpha_2$ -selective antagonist?

- Yohimbine**
- Tamsulosin

c) Tolazoline  
d) Prazosin

**004.** Indicate the irreversible alfa receptor antagonist:  
a) Tolazoline  
b) Labetalol  
c) Prazosin  
**d) Phenoxybenzamine**

**005.** Which of the following drugs is an nonselective beta receptor antagonist?  
a) Metoprolol  
b) Atenolol  
**c) Propranolol**  
d) Acebutolol

**006.** Indicate the beta<sub>1</sub>-selective antagonist:  
a) Propranolol  
**b) Metoprolol**  
c) Carvedilol  
d) Sotalol

**007.** Which of the following agents is a beta<sub>2</sub>-selective antagonist?  
a) Tolazolin  
b) Pindolol  
c) Ergotamin  
**d) Butoxamine**

**008.** Indicate the beta adrenoreceptor antagonist, which has partial beta-agonist activity:  
a) Propranolol  
b) Metoprolol  
**c) Pindolol**  
d) Betaxolol

**009.** Which of the following drugs is a reversible nonselective alfa, beta antagonist?  
**a) Labetalol**  
b) Phentolamine  
c) Metoprolol  
d) Propranolol

**010.** Indicate the indirect-acting adrenoreceptor blocking drug:  
a) Tolazoline  
**b) Reserpine**  
c) Carvedilol  
d) Prazosin

**011.** The principal mechanism of action of adrenoreceptor antagonists is:  
**a) Reversible or irreversible interaction with adrenoreceptors**  
b) Depletion of the storage of catecholamines  
c) Blockade of the amine reuptake pumps  
d) Nonselective MAO inhibition

**012.** Characteristics of alfa-receptor antagonists include all of the following EXCEPT:  
a) They cause a fall in peripheral resistance and blood pressure  
b) They cause epinephrine reversal (convert a pressor response to a depressor response)  
**c) Bronchospasm**  
d) They may cause postural hypotension and reflex tachycardia

**013.** Which of the following drugs is an imidazoline derivative and a potent competitive antagonist at both alfa<sub>1</sub> and alfa<sub>2</sub> receptors?  
a) Prazosin  
b) Labetalol  
c) Phenoxybenzamine  
**d) Phentolamine**

**014.** Characteristics of phentolamine include all of the following EXCEPT:  
a) Reduction in peripheral resistance  
**b) Stimulation of responses to serotonin**  
c) Tachycardia  
d) Stimulation of muscarinic, H<sub>1</sub> and H<sub>2</sub> histamine receptors

**015.** The principal mechanism of phentolamine-induced tachycardia is:  
**a) Antagonism of presynaptic alfa<sub>2</sub> receptors enhances norepinephrine release, which causes cardiac stimulation via unblocked beta receptors**

- b) Baroreflex mechanism
- c) Direct effect on the heart by stimulation of beta<sub>1</sub> receptors
- d) Inhibition of transmitter reuptake at noradrenergic synapses

**016.** Nonselective alfa-receptor antagonists are most useful in the treatment of:

- a) Asthma
- b) Cardiac arrhythmias
- c) Pheochromocytoma**
- d) Chronic hypertension

**017.** The main reason for using alfa-receptor antagonists in the management of pheochromocytoma is:

- a) Inhibition of the release of epinephrine from the adrenal medulla
- b) Blockade of alfa<sub>2</sub> receptors on vascular smooth muscle results in epinephrine stimulation of unblocked alfa<sub>2</sub> receptors**
- c) Direct interaction with and inhibition of beta<sub>2</sub> adrenoreceptors
- d) Antagonism to the release of renin

**018.** Which of the following drugs is useful in the treatment of pheochromocytoma?

- a) Phenylephrine
- b) Propranolol
- c) Phentolamine**
- d) Epinephrine

**019.** Indicate adrenoreceptor antagonist agents, which are used for the management of pheochromocytoma:

- a) Selective beta<sub>2</sub>-receptor antagonists
- b) Nonselective beta-receptor antagonists
- c) Indirect-acting adrenoreceptor antagonist drugs
- d) Alfa-receptor antagonists**

**020.** The principal adverse effects of phentolamine include all of the following EXCEPT:

- a) Diarrhea
- b) Bradycardia**
- c) Arrhythmias
- d) Myocardial ischemia

**021.** Indicate the reversible nonselective alfa-receptor antagonist, which is an ergot derivative:

- a) Ergotamine**
- b) Prazosin
- c) Phenoxybenzamine
- d) Carvedilol

**022.** Indicate an alfa-receptor antagonist, which binds covalently to alfa receptors, causing irreversible blockade of long duration (14-48 hours or longer):

- a) Phentolamine
- b) Phenoxybenzamine**
- c) Ergotamine
- d) Prazosin

**023.** Compared with phentolamine, prazosin has all of the following features EXCEPT:

- a) Irreversible blockade of alfa receptors**
- b) Highly selective for alfa<sub>1</sub> receptors
- c) The relative absence of tachycardia
- d) Persistent block of alfa<sub>1</sub> receptors

**024.** Which of the following statements is not correct?

- a) There are at least three subtypes of alfa<sub>1</sub> receptors, designated alfa<sub>1a</sub>, alfa<sub>1b</sub> and alfa<sub>1d</sub>
- b) ALFA<sub>1a</sub> subtype mediates prostate smooth muscle contraction
- c) ALFA<sub>1b</sub> subtype mediates vascular smooth muscle contraction
- d) ALFA<sub>1a</sub> subtype mediates both vascular and prostate smooth muscle contraction**

**025.** Indicate an alfa<sub>1</sub> adrenoreceptor antagonist, which has great selectivity for alfa<sub>1a</sub> subtype:

- a) Prazosin
- b) Tamsulosin**
- c) Phenoxybenzamine
- d) Phentolamine

**026.** Subtype-selective alfa<sub>1</sub> receptor antagonists such as tamsulosin, terazosin, alfuzosin are efficacious in:

- a) Hyperthyroidism
- b) Cardiac arrhythmias
- c) Benign prostatic hyperplasia (BPH)**
- d) Asthma

027. Indicate an alfa receptor antagonist, which is an efficacious drug in the treatment of mild to moderate systemic hypertension:

- Phentolamine
- Tolazoline
- Ergotamine
- Prazosin**

028. Which of the following alfa receptor antagonists is useful in reversing the intense local vasoconstriction caused by inadvertent infiltration of norepinephrine into subcutaneous tissue during intravenous administration?

- Propranolol
- Phentolamine**
- Tamsulosin
- Ergotamine

029. Beta-blocking drugs-induced chronically lower blood pressure may be associated with their effects on:

- The heart
- The blood vessels
- The renin-angiotensin system
- All of the above**

030. Characteristics of beta-blocking agents include all of the following EXCEPT:

- They occupy beta receptors and competitively reduce receptor occupancy by catecholamines or other beta agonists
- They do not cause hypotension in individuals with normal blood pressure
- They induce depression and depleted stores of catecholamines**
- They can cause blockade in the atrioventricular node

031. Beta-receptor antagonists have all of the following cardiovascular effects EXCEPT:

- The negative inotropic and chronotropic effects
- Acute effects of these drugs include a fall in peripheral resistance**
- Vasoconstriction
- Reduction of the release of renin

032. Beta-blocking agents have all of the following effects except:

- Increase plasma concentrations of HDL and decrease of VLDL**
- Bronchoconstriction
- Decrease of aqueous humor production
- “membrane-stabilizing” action

033. Beta-receptor antagonists cause:

- Stimulation of lipolysis
- Stimulation of gluconeogenesis
- Inhibition of glycogenolysis**
- Stimulation of insulin secretion

034. Propranolol has all of the following cardiovascular effects EXCEPT:

- It decreases cardiac work and oxygen demand
- It reduces blood flow to the brain**
- It inhibits the renin secretion
- It increases the atrioventricular nodal refractory period

035. Propranolol-induced adverse effects include all of the following EXCEPT:

- Bronchoconstriction
- “supersensitivity” of beta-adrenergic receptors (rapid withdrawal)
- Hyperglycemia**
- Sedation, sleep disturbances, depression and sexual dysfunction

036. Propranolol is used in the treatment all of the following diseases EXCEPT:

- Cardiovascular diseases
- Hyperthyroidism
- Migraine headache
- Bronchial asthma**

037. Metoprolol and atenolol:

- Are members of the beta<sub>1</sub>-selective group**
- Are nonselective beta antagonists
- Have intrinsic sympathomimetic activity
- Have an anesthetic action

038. Which of the following beta receptor antagonists is preferable in patients with asthma, diabetes or peripheral vascular diseases?

- Propranolol
- Metoprolol**

c) Nadolol  
d) Timolol

039. Indicate a beta receptor antagonist, which has very long duration of action:  
 a) Metoprolol  
b) Propranolol  
**c) Nadolol**  
d) Pindolol

040. Indicate a beta<sub>1</sub>-selective receptor antagonist, which has very long duration of action:  
**a) Betaxolol**  
 b) Sotalol  
c) Nadolol  
d) Metoprolol

041. Which of the following drugs is a nonselective beta-blocker without intrinsic sympathomimetic or local anesthetic activity and used for the treatment of life-threatening ventricular arrhythmias?  
 a) Propranolol  
b) Oxprenolol  
**c) Sotalol**  
d) Atenolol

042. Indicate a beta receptor antagonist with intrinsic sympathomimetic activity:  
 a) Propranolol  
**b) Oxprenolol**  
c) Metoprolol  
d) Carvedilol

043. Pindolol, oxprenolol have all of the following properties EXCEPT:  
 a) They are nonselective beta antagonists  
**b) They have no partial agonist activity**  
c) They are less likely to cause bradycardia and abnormalities in plasma lipids  
d) They are effective in hypertension and angina

044. Which of the following drugs has both alfa<sub>1</sub>-selective and beta-blocking effects?  
**a) Labetalol**  
 b) Betaxolol  
c) Propranolol  
d) Timolol

045. Characteristics of carvedilol include all of the following EXCEPT:  
**a) It is a beta<sub>1</sub>-selective antagonist**  
 b) It has both alfa<sub>1</sub>-selective and beta-blocking effects  
c) It attenuates oxygen free radical-initiated lipid peroxidation  
d) It inhibits vascular smooth muscle mitogenesis

046. Indicate the adrenoreceptor antagonist drug, which is a rauwolfa alkaloid:  
 a) Prazosin  
b) Propranolol  
**c) Reserpine**  
d) Phentolamine

047. Characteristics of reserpine include all of the following EXCEPT:  
**a) It inhibits the uptake of norepinephrine into vesicles and MAO**  
 b) It decreases cardiac output, peripheral resistance and inhibits pressor reflexes  
c) It may cause a transient sympathomimetic effect  
d) It depletes stores of catecholamines and serotonin in the brain

048. Indicate a beta-blocker, which is particularly efficacious in thyroid storm:  
 a) Pindolol  
b) Sotalol  
c) Phentolamine  
**d) Propranolol**

049. Beta-receptor blocking drugs are used in the treatment all of the following diseases EXCEPT:  
 a) Hypertension, ischemic heart disease, cardiac arrhythmias  
b) Glaucoma  
**c) Pheochromocytoma**  
d) Hyperthyroidism

050. Beta-blocker-induced adverse effects include all of the following EXCEPT:  
 a) Bronchoconstriction  
b) Depression of myocardial contractility and excitability

c) "supersensitivity" of beta-receptors associated with rapid withdrawal of drugs  
 d) **Hyperglycemia**

(3) AGENTS, CONTROLLING THE FUNCTIONS OF THE CENTRAL NERVOUS SYSTEM

**PART I Hypnotic drugs**

001. Hypnotic drugs are used to treat:  
 a) Psychosis  
**b) Sleep disorders**  
 c) Narcolepsy  
 d) Parkinsonian disorders

002. Hypnotic drugs should:  
 a) Reduce anxiety and exert a calming effect  
 b) Induce absence of sensation  
**c) Produce drowsiness, encourage the onset and maintenance of sleep**  
 d) Prevent mood swings in patients with bipolar affective disorders

003. Which of the following chemical agents are used in the treatment of insomnia?  
 a) Benzodiazepines  
 b) Imidazopyridines  
 c) Barbiturates  
**d) All of the above**

004. Select a hypnotic drug, which is a benzodiazepine derivative:  
 a) Zolpidem  
**b) Flurazepam**  
 c) Secobarbital  
 d) Phenobarbitone

005. Tick a hypnotic agent – a barbituric acid derivative:  
 a) Flurazepam  
 b) Zaleplon  
**c) Thiopental**  
 d) Triazolam

006. Select a hypnotic drug, which is an imidazopyridine derivative:  
 a) Pentobarbital  
 b) Temazepam  
**c) Zolpidem**  
 d) Chloral hydrate

007. Which of the following hypnotic agents is absorbed slowly?  
 a) Phenobarbital  
 b) Flurazepam  
 c) Triazolam  
**d) Temazepam**

008. Which of the following barbiturates is an ultra-short-acting drug?  
 a) Secobarbital  
 b) Amobarbital  
**c) Thiopental**  
 d) Phenobarbital

009. Indicate the barbituric acid derivative, which has 4-5 days elimination half-life:  
 a) Secobarbital  
 b) Thiopental  
**c) Phenobarbital**  
 d) Amobarbital

010. Indicate the hypnotic benzodiazepine, which has the shortest elimination half-life:  
 a) Temazepam  
**b) Triazolam**  
 c) Flurazepam  
 d) Diazepam

011. Which of the following hypnotic drugs is more likely to cause cumulative and residual effects?  
 a) Zolpidem  
 b) Temazepam  
**c) Phenobarbital**  
 d) Triazolam

012. Which of the following hypnotic drugs increases the activity of hepatic drug-metabolizing enzyme systems?

- Phenobarbital**
- Zolpidem
- Flurazepam
- Zaleplon

013. Hepatic microsomal drug-metabolizing enzyme induction leads to:

- Barbiturate tolerance**
- Cumulative effects
- Development of physical dependence
- "hangover" effects

014. Hypnotic benzodiazepines are more powerful enzyme inducers than barbiturates.

- True
- False**

015. Indicate the hypnotic drug, which does not change hepatic drug-metabolizing enzyme activity?

- Flurazepam
- Zaleplon
- Triazolam
- All of the above**

016. Barbiturates increase the rate of metabolism of:

- Anticoagulants
- Digitalis compounds
- Glucocorticoids
- All of the above**

017. Which of the following agents inhibits hepatic metabolism of hypnotics?

- Flumazenil
- Cimetidine**
- Phenytoin
- Theophylline

018. Which of the following factors can influence the biodisposition of hypnotic agents?

- Alterations in the hepatic function resulting from a disease
- Old age
- Drug-induced increases or decreases in microsomal enzyme activities
- All of the above**

019. Which of the following hypnotics is preferred for elderly patients?

- Phenobarbital
- Flurozepam
- Temazepam**
- Secobarbital

020. Which of the following hypnotics is preferred in patients with limited hepatic function?

- Zolpidem**
- Amobarbital
- Flurozepam
- Pentobarbital

021. Indicate the mechanism of barbiturate action (at hypnotic doses):

- Increasing the duration of the GABA-gated Cl<sup>-</sup> channel openings**
- Directly activating the chloride channels
- Increasing the frequency of Cl<sup>-</sup> channel opening events
- All of the above

022. Imidazopyridines are:

- Partial agonists at brain 5-HT<sub>1A</sub> receptors
- Selective agonists of the BZ<sub>1</sub> (omega<sub>1</sub>) subtype of BZ receptors**
- Competitive antagonists of BZ receptors
- Nonselective agonists of both BZ<sub>1</sub> and BZ<sub>2</sub> receptor subtypes

023. Which of the following hypnotic agents is a positive allosteric modulator of GABA<sub>A</sub> receptor function?

- Zaleplon
- Flurazepam
- Zolpidem
- All of the above**

024. Indicate a hypnotic drug - a selective agonist at the BZ<sub>1</sub> receptor subtype:

- Flurazepam
- Zolpidem**

c) Triazolam  
d) Flumazenil

025. Which of the following hypnotic agents is able to interact with both BZ<sub>1</sub> and BZ<sub>2</sub> receptor subtypes?  
 a) Zaleplon  
b) Phenobarbital  
**c) Flurazepam**  
d) Zolpidem

026. Indicate the competitive antagonist of BZ receptors:  
**a) Flumazenil**  
b) Picrotoxin  
c) Zolpidem  
d) Temazepam

027. Flumazenil blocks the actions of:  
 a) Phenobarbital  
b) Morphine  
**c) Zolpidem**  
d) Ethanol

028. Indicate the agent, which interferes with GABA binding:  
 a) Flurazepam  
**b) Bicuculline**  
c) Thiopental  
d) Zolpidem

029. Which of the following agents blocks the chloride channel directly?  
 a) Secobarbital  
b) Flumazenil  
c) Zaleplon  
**d) Picrotoxin**

030. Which of the following agents is preferred in the treatment of insomnia?  
 a) Barbiturates  
**b) Hypnotic benzodiazepines**  
c) Ethanol  
d) Phenothiazide

031. Barbiturates are being replaced by hypnotic benzodiazepines because of:  
 a) Low therapeutic index  
b) Suppression in REM sleep  
c) High potential of physical dependence and abuse  
**d) All of the above**

032. Which of the following benzodiazepines is used mainly for hypnosis?  
 a) Clonozepam  
b) Lorazepam  
**c) Flurazepam**  
d) Midazolam

033. Indicate the main claim for an ideal hypnotic agent:  
 a) Rapid onset and sufficient duration of action  
b) Minor effects on sleep patterns  
c) Minimal "hangover" effects  
**d) All of the above**

034. Which stage of sleep is responsible for the incidence of dreams?  
**a) REM sleep**  
b) Slow wave sleep  
c) Stage 2NREM sleep  
d) All of the above

035. During slow wave sleep (stage 3 and 4 NREM sleep):  
 a) Dreams occur  
b) The secretion of adrenal steroids is at its highest  
**c) Somnambulism and nightmares occur**  
d) The secretion of somatotropin is at its lowest

036. All of the hypnotic drugs induce:  
 a) Increase the duration of REM sleep  
**b) Decrease the duration of REM sleep**  
c) Do not alter the duration of REM sleep

d) Increase the duration of slow wave sleep

**037.** Which of the following hypnotic drugs causes least suppression of REM sleep?

- Flumazenil
- Phenobarbital
- Flurazepam**
- Secobarbital

**038.** Although the benzodiazepines continue to be the agents of choice for insomnia, they have:

- The possibility of psychological and physiological dependence
- Synergistic depression of CNS with other drugs (especially alcohol)
- Residual drowsiness and daytime sedation
- All of the above**

**039.** Hypnotic benzodiazepines can cause:

- A dose-dependent increase in both REM and slow wave sleep
- Do not change sleep patterns
- A dose-dependent decrease in both REM and slow wave sleep**
- A dose-dependent increase in REM sleep and decrease in slow wave sleep

**040.** Which one of the following hypnotic benzodiazepines is more likely to cause rebound insomnia?

- Triazolam**
- Flurazepam
- Temazepam
- All of the above

**041.** Which of the following hypnotic benzodiazepines is more likely to cause "hangover" effects such as drowsiness, dysphoria, and mental or motor depression the following day?

- Temazepam
- Triazolam
- Flurazepam**
- None of the above

**042.** Indicate the hypnotic drug, which binds selectively to the BZ<sub>1</sub> receptor subtype, facilitating GABAergic inhibition:

- Thiopental
- Zolpidem**
- Flurazepam
- Phenobarbital

**043.** Which of the following statements is correct for zolpidem?

- Causes minor effects on sleep patterns
- The risk of development of tolerance and dependence is less than with the use of hypnotic benzodiazepines
- Has minimal muscle relaxing and anticonvulsant effects
- All of the above**

**044.** Which agent exerts hypnotic activity with minimal muscle relaxing and anticonvulsant effects?

- Flurazepam
- Triazolam
- Zaleplon**
- None of the above

**045.** Zolpidem and zaleplon have effectiveness similar to that of hypnotic benzodiazepines in the management of sleep disorders.

- True**
- False

**046.** Which of the following hypnotic drugs is used intravenously as anesthesia?

- Thiopental**
- Phenobarbital
- Flurazepam
- Zolpidem

**047.** Indicate the usual cause of death due to overdose of hypnotics:

- Depression of the medullary respiratory center**
- Hypothermia
- Cerebral edema
- Status epilepticus

**048.** Toxic doses of hypnotics may cause a circulatory collapse as a result of:

- Blocking alfa adrenergic receptors
- Increasing vagal tone
- Action on the medullary vasomotor center**
- All of the above

## **PART II Antiseizure drugs**

**001.** The mechanism of action of antiseizure drugs is:

- Enhancement of GABAergic (inhibitory) transmission
- Diminution of excitatory (usually glutamatergic) transmission
- Modification of ionic conductance
- All of the above mechanisms**

**002.** Which of the following antiseizure drugs produces enhancement of GABA-mediated inhibition?

- Ethosuximide
- Carbamazepine
- Phenobarbital**
- Lamotrigine

**003.** Indicate an antiseizure drug, which has an impotent effect on the T-type calcium channels in thalamic neurons?

- Carbamazepin
- Lamotrigine
- Ethosuximide**
- Phenytoin

**004.** Which of the following antiseizure drugs produces a voltage-dependent inactivation of sodium channels?

- Lamotrigine
- Carbamazepin
- Phenytoin
- All of the above**

**005.** Indicate an antiseizure drug, inhibiting central effects of excitatory amino acids:

- Ethosuximide
- Lamotrigine**
- Diazepam
- Tiagabine

**006.** The drug for partial and generalized tonic-clonic seizures is:

- Carbamazepine
- Valproate
- Phenytoin
- All of the above**

**007.** Indicate an anti-absence drug:

- Valproate**
- Phenobarbital
- Carbamazepin
- Phenytoin

**008.** The drug against myoclonic seizures is:

- Primidone
- Carbamazepine
- Clonazepam**
- Phenytoin

**009.** The most effective drug for stopping generalized tonic-clonic status epilepticus in adults is:

- Lamotrigine
- Ethosuximide
- Diazepam**
- Zonisamide

**010.** Select the appropriate consideration for phenytoin:

- It blocks sodium channels**
- It binds to an allosteric regulatory site on the GABA-BZ receptor and prolongs the openings of the Cl<sup>-</sup> channels
- It effects on Ca<sup>2+</sup> currents, reducing the low-threshold (T-type) current
- It inhibits GABA-transaminase, which catalyzes the breakdown of GABA

**011.** Phenytoin is used in the treatment of:

- Petit mal epilepsy
- Grand mal epilepsy**
- Myoclonic seizures
- All of the above

**012.** Dose-related adverse effect caused by phenytoin is:

- Physical and psychological dependence
- Exacerbated grand mal epilepsy
- Gingival hyperplasia**
- Extrapyramidal symptoms

013. Granulocytopenia, gastrointestinal irritation, gingival hyperplasia, and facial hirsutism are possible adverse effects of:

- Phenobarbital
- Carbamazepin
- Valproate
- Phenytoin**

014. The antiseizure drug, which induces hepatic microsomal enzymes, is:

- Lamotrigine
- Phenytoin**
- Valproate
- None of the above

015. The drug of choice for partial seizures is:

- Carbamazepin**
- Ethosuximide
- Diazepam
- Lamotrigine

016. The mechanism of action of carbamazepine appears to be similar to that of:

- Benzodiazepines
- Valproate
- Phenytoin**
- Ethosuximide

017. Which of the following antiseizure drugs is also effective in treating trigeminal neuralgia?

- Primidone
- Topiramate
- Carbamazepine**
- Lamotrigine

018. The most common dose-related adverse effects of carbamazepine are:

- Diplopia, ataxia, and nausea**
- Gingival hyperplasia, hirsutism
- Sedation, physical and psychological dependence
- Hemeralopia, myasthenic syndrome

019. Indicate the drug of choice for status epilepticus in infants and children:

- Phenobarbital sodium**
- Clonazepam
- Ethosuximide
- Phenytoin

020. Barbiturates are used in the emergency treatment of status epilepticus in infants and children because of:

- They significantly decrease of oxygen utilization by the brain, protecting cerebral edema and ischemia**
- Short onset and duration of action
- They do not have effect on sleep architecture
- All of the above

021. Which of the following antiseizure drugs binds to an allosteric regulatory site on the GABA-BZ receptor, increases the duration of the Cl<sup>-</sup> channels openings:

- Diazepam
- Valproate
- Phenobarbital**
- Topiramate

022. Adverse effect caused by phenobarbital is:

- Physical and phychological dependence
- Exacerbated petit mal epilepsy
- Sedation
- All of the above**

023. Which of the following antiseizure drugs is a prodrug, metabolized to phenobarbital?

- Phenytoin
- Primidone**
- Felbamate
- Vigabatrin

024. Indicate the antiseizure drug, which is a phenyltriazine derivative:

- Phenobarbital
- Clonazepam
- Lamotrigine**
- Carbamazepin

025. Lamotrigine can be used in the treatment of:

- a) Partial seizures
- b) Absence
- c) Myoclonic seizures
- d) All of the above**

026. The mechanism of vigabatrin's action is:

- a) Direct action on the GABA receptor-chloride channel complex
- b) Inhibition of GABA aminotransferase**
- c) NMDA receptor blockade via the glycine binding site
- d) Inhibition of GABA neuronal reuptake from synapses

027. Indicate an irreversible inhibitor of GABA aminotransferase (GABA-T):

- a) Diazepam
- b) Phenobarbital
- c) Vigabatrin**
- d) Felbamate

028. Tiagabine:

- a) Blocks neuronal and glial reuptake of GABA from synapses**
- b) Inhibits GABA-T, which catalyzed the breakdown of GABA
- c) Blocks the T-type  $\text{Ca}^{2+}$  channels
- d) Inhibits glutamate transmission at AMPA/kainate receptors

029. The mechanism of both topiramate and felbamate action is:

- a) Reduction of excitatory glutamatergic neurotransmission
- b) Inhibition of voltage sensitive  $\text{Na}^+$  channels
- c) Potentiation of GABAergic neuronal transmission
- d) All of the above**

030. The drug of choice in the treatment of petit mal (absence seizures) is:

- a) Phenytoin
- b) Ethosuximide**
- c) Phenobarbital
- d) Carbamazepin

031. The dose-related adverse effect of ethosuximide is:

- a) Gastrointestinal reactions, such as anorexia, pain, nausea and vomiting
- b) Exacerbated grand mal epilepsy
- c) Transient lethargy or fatigue
- d) All of the above**

032. Valproate is very effective against:

- a) Absence seizures
- b) Myoclonic seizures
- c) Generalized tonic-clonic seizures
- d) All of the above**

033. The drug of choice in the treatment of myoclonic seizures is:

- a) Valproate**
- b) Phenobarbital
- c) Phenytoin
- d) Felbamate

034. The reason for preferring ethosuximide to valproate for uncomplicated absence seizures is:

- a) More effective
- b) Valproate's idiosyncratic hepatotoxicity**
- c) Greater CNS depressant activity
- d) All of the above

035. The mechanism of valproate action is:

- a) Facilitation glutamic acid decarboxylase, the enzyme responsible for GABA synthesis and inhibition of GABA-aminotransferase, the enzyme responsible for the breakdown of GABA (enhance GABA accumulation)
- b) Inhibition of voltage sensitive  $\text{Na}^+$  channels
- c) Inhibition of low threshold (T-type)  $\text{Ca}^{2+}$  channels
- d) All of the above**

036. Indicate the antiseizure drug, which is a sulfonamide derivative, blocking  $\text{Na}^+$  channels and having additional ability to inhibit T-type  $\text{Ca}^{2+}$  channels:

- a) Tiagabine
- b) Zonisamide**
- c) Ethosuximide

d) Primidone

**037.** Indicate the antiseizure drug – a benzodiazepine receptor agonist:

- Phenobarbital
- Phenytoin
- Carbamazepine
- Lorazepam**

**038.** Which of the following antiseizure drugs acts directly on the GABA receptor-chloride channel complex?

- Vigabatrin
- Diazepam**
- Gabapentin
- Valproate

**039.** Benzodiazepine's usefulness is limited by:

- Tolerance**
- Atropine-like symptoms
- Psychotic episodes
- Myasthenic syndrome

**040.** A long-acting drug against both absence and myoclonic seizures is:

- Primidone
- Carbamazepine
- Clonazepam**
- Phenytoin

**041.** Which of the following antiseizure drugs may produce teratogenicity?

- Phenytoin
- Valproate
- Topiramate
- All of the above**

**042.** The most dangerous effect of antiseizure drugs after large overdoses is:

- Respiratory depression**
- Gastrointestinal irritation
- Alopecia
- Sedation

**PART III Antiparkinsonian agents**

**001.** Which neurons are involved in parkinsonism?

- Cholinergic neurons
- GABAergic neurons
- Dopaminergic neurons
- All of the above**

**002.** The pathophysiologic basis for antiparkinsonism therapy is:

- A selective loss of dopaminergic neurons**
- The loss of some cholinergic neurons
- The loss of the GABAergic cells
- The loss of glutamatergic neurons

**003.** Which of the following neurotransmitters is involved in Parkinson's disease?

- Acetylcholine
- Glutamate
- Dopamine
- All of the above**

**004.** The concentration of dopamine in the basal ganglia of the brain is reduced in parkinsonism.

- True**
- False

**005.** Principal aim for treatment of Parkinsonian disorders is:

- To restore the normal balance of cholinergic and dopaminergic influences on the basal ganglia with antimuscarinic drugs
- To restore dopaminergic activity with levodopa and dopamine agonists
- To decrease glutamatergic activity with glutamate antagonists
- All of the above**

**006.** Indicate the drug that induces parkinsonian syndromes:

- Chlorpromazine**
- Diazepam

c) Triazolam  
d) Carbamazepine

**007.** Which of the following drugs is used in the treatment of Parkinsonian disorders?  
 a) Phenytoin  
**b) Selegiline**  
 c) Haloperidol  
 d) Fluoxetine

**008.** Select the agent, which is preferred in the treatment of the drug-induced form of parkinsonism:  
 a) Levodopa  
 b) Bromocriptine  
**c) Benztropine**  
 d) Dopamine

**009.** Which of the following agents is the precursor of dopamine?  
 a) Bromocriptine  
**b) Levodopa**  
 c) Selegiline  
 d) Amantadine

**010.** The main reason for giving levodopa, the precursor of dopamine, instead of dopamine is:  
**a) Dopamine does not cross the blood-brain barrier**  
 b) Dopamine may induce acute psychotic reactions  
 c) Dopamine is intensively metabolized in humans  
 d) All of the above

**011.** Indicate a peripheral dopa decarboxylase inhibitor:  
 a) Tolcapone  
 b) Clozapine  
**c) Carbidopa**  
 d) Selegiline

**012.** The mechanism of carbidopa's action is:  
 a) Stimulating the synthesis, release, or reuptake of dopamine  
**b) Inhibition of dopa decarboxilase**  
 c) Stimulating dopamine receptors  
 d) Selective inhibition of catecol-O-methyltransferase

**013.** Carbidopa is unable to penetrate the blood-brain barrier, it acts to reduce the peripheral conversion of levodopa to dopamine.  
**a) True**  
 b) False

**014.** When carbidopa and levodopa are given concomitantly:  
 a) Levodopa blood levels are increased, and drug half-life is lengthened  
 b) The dose of levodopa can be significantly reduced (by 75%), also reducing toxic side effects  
 c) A shorter latency period precedes the occurrence of beneficial effects  
**d) All of the above**

**015.** Which of the following preparations combines carbidopa and levodopa in a fixed proportion?  
 a) Selegiline  
**b) Sinemet**  
 c) Tolcapone  
 d) Biperiden

**016.** Which of the following statements is correct for levodopa?  
 a) Tolerance to both beneficial and adverse effects develops gradually  
 b) Levodopa is most effective in the first 2-5 years of treatment  
 c) After 5 years of therapy, patients have dose-related dyskinesias, inadequate response or toxicity  
**d) All of the above**

**017.** Gastrointestinal irritation, cardiovascular effects, including tachycardia, arrhythmias, and orthostatic hypotension, mental disturbances, and withdrawal are possible adverse effects of:  
 a) Amantadine  
 b) Benztropine  
**c) Levodopa**  
 d) Selegiline

**018.** Which of the following agents is the most helpful in counteracting the behavioral complications of levodopa?  
 a) Tolcapone  
**b) Clozapine**  
 c) Carbidopa

d) Pergolide

**019.** Which of the following vitamins reduces the beneficial effects of levodopa by enhancing its extracerebral metabolism?

- Pyridoxine**
- Thiamine
- Tocopherol
- Riboflavin

**020.** Which of the following drugs antagonizes the effects of levodopa because it leads to a junctional blockade of dopamine action?

- Reserpine
- Haloperidol
- Chlorpromazine
- All of the above**

**021.** Levodopa should not be given to patients taking:

- Bromocriptine
- Monoamine oxidase A inhibitors**
- Carbidopa
- Nonselective beta-adrenergic antagonists

**022.** Indicate D<sub>2</sub> receptor agonist with antiparkinsonian activity:

- Sinemet
- Levodopa
- Bromocriptine**
- Selegiline

**023.** Which of the following antiparkinsonian drugs has also been used to treat hyperprolactinemia?

- Benztropine
- Bromocriptine**
- Amantadine
- Levodopa

**024.** Indicate a selective inhibitor of monoamine oxidase B:

- Levodopa
- Amantadine
- Tolcapone
- Selegiline**

**025.** Which of the following statements is correct?

- MAO-A metabolizes dopamine; MAO-B metabolizes serotonin
- MAO-A metabolizes norepinephrine and dopamine; MAO-B metabolizes serotonin
- MAO-A metabolizes norepinephrine and serotonin; MAO-B metabolizes dopamine**
- MAO-A metabolizes dopamine; MAO-B metabolizes norepinephrine and serotonin

**026.** Treatment with selegilin postpones the need for levodopa for 3-9 months and may retard the progression of Parkinson's disease.

- True**
- False

**027.** The main reason for avoiding the combined administration of levodopa and an inhibitor of both forms of monoamine oxidase is:

- Respiratory depression
- Hypertensive emergency**
- Acute psychotic reactions
- Cardiovascular collapse and CNS depression

**028.** Indicate selective catechol-O-methyltransferase inhibitor, which prolongs the action of levodopa by diminishing its peripheral metabolism:

- Carbidopa
- Clozapine
- Tolcapone**
- Rasagiline

**029.** Which of the following antiparkinsonian drugs is an antiviral agent used in the prophylaxis of influenza A<sub>2</sub>?

- Selegiline
- Sinemet
- Pergolide
- Amantadine**

**030.** The mechanism of amantadine action is:

- Stimulating the glutamatergic neurotransmission**
- Blocking the excitatory cholinergic system

- c) Inhibition of dopa decarboxilase
- d) Selective inhibition of catechol-O-methyltransferase

031. Which of the following antiparkinsonism drugs is an anticholinergic agent?

- a) Amantadine
- b) Selegilin
- c) Trihexyphenidyl**
- d) Bromocriptine

032. Mental confusion and hallucinations, peripheral atropine-like toxicity (e.g. Cycloplegia, tachycardia, urinary retention, and constipation) are possible adverse effects of:

- a) Sinemet
- b) Benztropine**
- c) Tolcapone
- d) Bromocriptine

033. Indicate the antiparkinsonism drug which should be avoided in patients with glaucoma:

- a) Selegilin
- b) Levodopa
- c) Bromocriptine
- d) Trihexyphenidyl**

#### **PART IV Ethyl alcohol**

001. Alcohol may cause:

- a) CNS depression
- b) Vasodilatation
- c) Hypoglycemia
- d) All of the above**

002. Alcohol:

- a) Increases body temperature
- b) Decreases body heat loss
- c) Increases body heat loss**
- d) Does not affect body temperature

003. It is undesirable to take alcohol before going outdoors when it extremely cold, but it may be harmless to take some after coming into a warm place from the cold.

- a) True**
- b) False

004. The most common medical complication of alcohol abuse is:

- a) Liver failure including liver cirrhosis
- b) Tolerance and physical dependence
- c) Generalized symmetric peripheral nerve injury, ataxia and dementia
- d) All of the above**

005. Effect of moderate consumption of alcohol on plasma lipoproteins is:

- a) Raising serum levels of high-density lipoproteins**
- b) Increasing serum concentration of low-density lipoproteins
- c) Decreasing the concentration of high-density lipoproteins
- d) Raising serum levels of very low-density lipoproteins

006. Which of the following metabolic alterations may be associated with chronic alcohol abuse?

- a) Hyperglycemia
- b) Increased serum concentration of phosphate
- c) Severe loss of potassium and magnesium**
- d) Decreased serum concentration of sodium

007. Alcohol potentiates:

- a) SNS depressants
- b) Vasodilatators
- c) Hypoglycemic agents
- d) All of the above**

008. Which of the following drugs is most commonly used for causing a noxious reaction to alcohol by blocking its metabolism?

- a) Naltrexone
- b) Disulfiram**
- c) Diazepam
- d) Morphine

009. Which of the following agents is an inhibitor of aldehyde dehydrogenase?

- a) Fomepizole
- b) Ethanol
- c) Disulfiram**
- d) Naltrexone

010. Indicate the drug, which alters brain responses to alcohol:

- a) Naltrexone**
- b) Disulfiram
- c) Amphetamine
- d) Chlorpromazine

011. Which of the following agents is an opioid antagonist?

- a) Amphetamine
- b) Naltrexone**
- c) Morphine
- d) Disulfiram

012. Alcohol causes an acute increase in the local concentrations of:

- a) Dopamine
- b) Opioid
- c) Serotonin
- d) All of the above**

013. Management of alcohol withdrawal syndrome contains:

- a) Restoration of potassium, magnesium and phosphate balance
- b) Thiamine therapy
- c) Substituting a long-acting sedative-hypnotic drug for alcohol
- d) All of the above**

014. Indicate the drug, which decreases the craving for alcohol or blunts pleasurable "high" that comes with renewed drinking:

- a) Disulfiram
- b) Amphetamine
- c) Naltrexone**
- d) Diazepam

015. The symptoms resulting from the combination of disulfiram and alcohol are:

- a) Hypertensive crisis leading to cerebral ischemia and edema
- b) Nausea, vomiting**
- c) Respiratory depression and seizures
- d) Acute psychotic reactions

016. The combination of disulfiram and ethanol leads to accumulation of:

- a) Formaldehyde
- b) Acetate
- c) Formic acid
- d) Acetaldehyde**

017. The combination of naltrexone and disulfiram should be avoided since both drugs are potential hepatotoxins.

- a) True**
- b) False

018. Indicate the "specific" modality of treatment for severe methanol poisoning:

- a) Dialysis to enhance removal of methanol
- b) Alkalization to counteract metabolic acidosis
- c) Suppression of metabolism by alcohol dehydrogenase to toxic products
- d) All of the above**

019. Which of the following agents may be used as an antidote for ethylene glycol and methanol poisoning?

- a) Disulfiram
- b) Fomepizol**
- c) Naltrexone
- d) Amphetamine

020. The principal mechanism of fomepizol action is associated with inhibition of:

- a) Aldehyde dehydrogenase
- b) Acethylholinesterase
- c) Alcohol dehydrogenase**
- d) Monoamine oxidase

## PART V Narcotic analgesics

001. Narcotics analgesics should:

- a) **Relieve severe pain**
- b) Induce loss of sensation
- c) Reduce anxiety and exert a calming effect
- d) Induce a stupor or somnolent state

002. Second-order pain is:

- a) Sharp, well-localized pain
- b) **Dull, burning pain**
- c) Associated with fine myelinated A-delta fibers
- d) Effectively reduced by non-narcotic analgesics

003. Chemical mediators in the nociceptive pathway are all of the following EXCEPT:

- a) **Enkephalins**
- b) Kinins
- c) Prostaglandins
- d) Substance P

004. Indicate the chemical mediator in the antinociceptive descending pathways:

- a) BETA-endorphin
- b) Met- and leu-enkephalin
- c) Dynorphin
- d) **All of the above**

005. Which of the following mediators is found mainly in long descending pathways from the midbrain to the dorsal horn?

- a) Prostaglandin E
- b) Dynorphin
- c) **Enkephalin**
- d) Glutamate

006. Select the brain and spinal cord regions, which are involved in the transmission of pain?

- a) The limbic system, including the amygdaloidal nucleus and the hypothalamus
- b) The ventral and medial parts of the thalamus
- c) The substantia gelatinosa
- d) **All of the above**

007. Mu ( $\mu$ ) receptors are associated with:

- a) **Analgesia, euphoria, respiratory depression, physical dependence**
- b) Spinal analgesia, mydriasis, sedation, physical dependence
- c) Dysphoria, hallucinations, respiratory and vasomotor stimulation
- d) Analgesia, euphoria, respiratory stimulation, physical dependence

008. Which of the following opioid receptor types is responsible for euphoria and respiratory depression?

- a) Kappa-receptors
- b) Delta-receptors
- c) **Mu-receptors**
- d) All of the above

009. Indicate the opioid receptor type, which is responsible for dysphoria and vasomotor stimulation:

- a) **Kappa-receptors**
- b) Delta-receptors
- c) Mu-receptors
- d) All of the above

010. Kappa and delta agonists:

- a) Inhibit postsynaptic neurons by opening  $K^+$  channels
- b) **Close a voltage-gated  $Ca^{2+}$  channels on presynaptic nerve terminals**
- c) Both a and b
- d) Inhibit of arachidonate cyclooxygenase in CNS

011. Which of the following supraspinal structures is implicated in pain-modulating descending pathways?

- a) **The midbrain periaqueductal gray**
- b) The hypothalamus
- c) The area postrema
- d) The limbic cortex

012. Indicate the neurons, which are located in the locus ceruleus or the lateral tegmental area of the reticular formation:

- a) Dopaminergic
- b) Serotonergic
- c) **Nonadrenergic**
- d) Gabaergic

013. Which of the following analgesics is a phenanthrene derivative?

- a) Fentanyl
- b) Morphine**
- c) Methadone
- d) Pentazocine

014. Tick narcotic analgesic, which is a phenylpiperidine derivative:

- a) Codeine
- b) Dezocine
- c) Fentanyl**
- d) Buprenorphine

015. Which of the following opioid analgesics is a strong mu receptor agonist?

- a) Naloxone
- b) Morphine**
- c) Pentazocine
- d) Buprenorphine

016. Indicate the narcotic analgesic, which is a natural agonist:

- a) Meperidine
- b) Fentanyl
- c) Morphine**
- d) Naloxone

017. Select the narcotic analgesic, which is an antagonist or partial mu receptor agonist:

- a) Fentanyl
- b) Pentazocine**
- c) Codeine
- d) Methadone

018. Which of the following agents is a full antagonist of opioid receptors?

- a) Meperidine
- b) Buprenorphine
- c) Naloxone**
- d) Butorphanol

019. The principal central nervous system effect of the opioid analgesics with affinity for a mu receptor is:

- a) Analgesia
- b) Respiratory depression
- c) Euphoria
- d) All of the above**

020. Which of the following opioid analgesics can produce dysphoria, anxiety and hallucinations?

- a) Morphine
- b) Fentanyl
- c) Pentazocine**
- d) Methadone

021. Indicate the opioid analgesic, which has 80 times analgesic potency and respiratory depressant properties of morphine, and is more effective than morphine in maintaining hemodynamic stability?

- a) Fentanyl**
- b) Pentazocine
- c) Meperidine
- d) Nalmefene

022. Which of the following opioid analgesics is used in combination with droperidol in neuroleptanalgesia?

- a) Morphine
- b) Buprenorphine
- c) Fentanyl**
- d) Morphine

023. Fentanyl can produce significant respiratory depression by:

- a) Inhibiting brain stem respiratory mechanisms
- b) Suppression of the cough reflex leading to airway obstruction
- c) Development of truncal rigidity
- d) Both a and c**

024. Most strong mu receptor agonists cause:

- a) Hypertension
- b) Increasing the pulmonary arterial pressure and myocardial work
- c) Cerebral vasodilatation, causing an increase in intracranial pressure**
- d) All of the above

025. Which of the following opioid analgesics can produce an increase in the pulmonary arterial pressure and myocardial work?

- a) Morphine
- b) Pentazocine**
- c) Meperidine
- d) Methadone

026. Morphine causes the following effects EXCEPT:

- a) Constipation
- b) Dilatation of the biliary duct**
- c) Urinary retention
- d) Bronchiolar constriction

027. Therapeutic doses of the opioid analgesics:

- a) Decrease body temperature**
- b) Increase body temperature
- c) Decrease body heat loss
- d) Do not affect body temperature

028. Which of the following opioid analgesics is used in obstetric labor?

- a) Fentanyl
- b) Pentazocine
- c) Meperidine**
- d) Buprenorphine

029. Indicate the opioid analgesic, which is used for relieving the acute, severe pain of renal colic:

- a) Morphine
- b) Naloxone
- c) Methadone
- d) Meperidine**

030. Which of the following opioid analgesics is used in the treatment of acute pulmonary edema?

- a) Morphine**
- b) Codeine
- c) Fentanyl
- d) Loperamide

031. The relief produced by intravenous morphine in dyspnea from pulmonary edema is associated with reduced:

- a) Perception of shortness of breath
- b) Patient anxiety
- c) Cardiac preload (reduced venous tone) and afterload (decreased peripheral resistance)
- d) All of the above**

032. Rhinorrhea, lacrimation, chills, gooseflesh, hyperventilation, hyperthermia, mydriasis, muscular aches, vomiting, diarrhea, anxiety, and hostility are effects of:

- a) Tolerance
- b) Opioid over dosage
- c) Drug interactions between opioid analgesics and sedative-hypnotics
- d) Abstinence syndrome**

033. The diagnostic triad of opioid overdosage is:

- a) Mydriasis, coma and hyperventilation
- b) Coma, depressed respiration and miosis**
- c) Mydriasis, chills and abdominal cramps
- d) Miosis, tremor and vomiting

034. Which of the following opioid agents is used in the treatment of acute opioid overdose?

- a) Pentazocine
- b) Methadone
- c) Naloxone**
- d) Remifentanil

035. Indicate the pure opioid antagonist, which has a half-life of 10 hours:

- a) Naloxone
- b) Naltrexone**
- c) Tramadol
- d) Pentazocine

036. In contrast to morphine, methadone:

- a) Causes tolerance and physical dependence more slowly
- b) Is more effective orally
- c) Withdrawal is less severe, although more prolonged

**d) All of the above**

037. Which of the following opioid analgesics is a partial mu receptor agonist?

- a) Morphine
- b) Methadone
- c) Buprenorphine**
- d) Sufentanil

038. Indicate a partial mu receptor agonist, which has 20-60 times analgesic potency of morphine, and a longer duration of action:

- a) Pentazocine
- b) Buprenorphine**
- c) Nalbuphine
- d) Naltrexone

039. Which of the following opioid analgesics is a strong kappa receptor agonist and a mu receptor antagonist?

- a) Naltrexone
- b) Methadone
- c) Nalbuphine**
- d) Buprenorphine

040. Which of the following drugs has weak mu agonist effects and inhibitory action on norepinephrine and serotonin reuptake in the CNS?

- a) Loperamide
- b) Tramadol**
- c) Fluoxetine
- d) Butorphanol

**PART VI Non-narcotic analgesics**

001. Non-narcotic analgesics are mainly effective against pain associated with:

- a) Inflammation or tissue damage**
- b) Trauma
- c) Myocardial infarction
- d) Surgery

002. Non-narcotic agents cause:

- a) Respiratory depression
- b) Antipyretic effect**
- c) Euphoria
- d) Physical dependence

003. Non-narcotic analgesics are all of the following drugs EXCEPT:

- a) Paracetamol
- b) Acetylsalicylic acid
- c) Butorphanol**
- d) Ketorolac

004. Select the non-narcotic drug, which is a paraaminophenol derivative:

- a) Analgin
- b) Aspirin
- c) Baclophen
- d) Paracetamol**

005. Which of the following non-narcotic agents is salicylic acid derivative?

- a) Phenylbutazone
- b) Ketamine
- c) Aspirin**
- d) Tramadol

006. Tick pirazolone derivative:

- a) Methylsalicylate
- b) Analgin**
- c) Paracetamol
- d) Ketorolac

007. Which one of the following non-narcotic agents inhibits mainly cyclooxygenase (COX) in CNS?

- a) Paracetamol**
- b) Ketorolac
- c) Acetylsalicylic acid
- d) Ibuprofen

008. Most of non-narcotic analgetics have:

- a) Anti-inflammatory effect
- b) Analgesic effect
- c) Antipyretic effect
- d) All of the above**

009. Indicate the non-narcotic analgesic, which lacks an anti-inflammatory effect:

- a) Naloxone
- b) Paracetamol**
- c) Metamizole
- d) Aspirin

010. Correct statements concerning aspirin include all of the following EXCEPT:

- a) It inhibits mainly peripheral COX
- b) It does not have an anti-inflammatory effect**
- c) It inhibits platelet aggregation
- d) It stimulates respiration by a direct action on the respiratory center

011. For which of the following conditions could aspirin be used prophylactically?

- a) Noncardiogenic pulmonary edema
- b) Peptic ulcers
- c) Thromboembolism**
- d) Metabolic acidosis

012. All of the following are undesirable effects of aspirin EXCEPT:

- a) Gastritis with focal erosions
- b) Tolerance and physical addiction**
- c) Bleeding due to a decrease of platelet aggregation
- d) Reversible renal insufficiency

013. Characteristic findings of salicylism include:

- a) Headache, mental confusion and drowsiness
- b) Tinnitus and difficulty in hearing
- c) Hyperthermia, sweating, thirst, hyperventilation, vomiting and diarrhea
- d) All of the above**

014. Analgin usefulness is limited by:

- a) Agranulocytosis**
- b) Erosions and gastric bleeding
- c) Methemoglobinemia
- d) Hearing impairment

015. Methemoglobinemia is possible adverse effect of:

- a) Aspirin
- b) Paracetamol**
- c) Analgin
- d) Ketorolac

016. Correct the statements concerning ketorolac include all of the following EXCEPT:

- a) It inhibits COX
- b) It is as effective as morphine for a short-term relief from moderate to severe pain
- c) It has a high potential for physical dependence and abuse**
- d) It does not produce respiratory depression

017. Indicate the nonopiod agent of central effect with analgesic activity:

- a) Reserpine
- b) Propranolol
- c) Clonidine**
- d) Prazosin

018. Select the antiseizure drug with an analgesic component of effect:

- a) Carbamazepine**
- b) Ethosuximide
- c) Phenytoin
- d) Clonazepam

019. Which of the following nonopiod agents is an antidepressant with analgesic activity?

- a) Fluoxetine
- b) Moclobemide
- c) Tranylcypromine
- d) Amitriptyline**

020. Tick mixed (opioid/non-opioid) agent:

- a) Paracetamol
- b) Tramadol**
- c) Sodium valproate
- d) Butorphanol

**PART VII Antipsychotic agents**

001. Neuroleptics are used to treat:

- a) Neurosis
- b) Psychosis**
- c) Narcolepsy
- d) Parkinsonian disorders

002. Most antipsychotic drugs:

- a) Strongly block postsynaptic  $D_2$  receptor**
- b) Stimulate postsynaptic  $D_2$  receptor
- c) Block NMDA receptor
- d) Stimulate 5-HT<sub>2</sub> receptor

003. Which of the following dopaminergic systems is most closely related to behavior?

- a) The hypothalamic-pituitary system
- b) The extrapyramidal system
- c) The mesolimbic and mesofrontal systems**
- d) The chemoreceptor trigger zone of the medulla

004. Hyperprolactinemia is caused by blockade of dopamine in:

- a) The chemoreceptor trigger zone of the medulla
- b) The pituitary**
- c) The extrapyramidal system
- d) The mesolimbic and mesofrontal systems

005. Parkinsonian symptoms and tardive dyskinesia are caused by blockade dopamine in:

- a) The nigrostriatal system**
- b) The mesolimbic and mesofrontal systems
- c) The chemoreceptor trigger zone of the medulla
- d) The tuberoinfundibular system

006. Extrapiramidal reactions can be treated by:

- a) Levodopa
- b) Benztropine mesylate**
- c) Bromocriptine
- d) Dopamine

007. Which of the following statements is true?

- a)  $D_1$  postsynaptic receptors are located in striatum
- b)  $D_2$  pre- and postsynaptic receptors are located in striatum and limbic areas
- c)  $D_4$  postsynaptic receptors are located in frontal cortex, mesolimbic system
- d) All of the above**

008. Which of the following antipsychotic drugs is typical?

- a) Clozapine
- b) Quetiapine
- c) Haloperidol**
- d) Olanzapine

009. Indicate the atypical antipsychotic drug:

- a) Haloperidol
- b) Clozapine**
- c) Thioridazine
- d) Thiothixene

010. Atypical antipsychotic agents (such as clozapine) differ from typical ones:

- a) In reduced risks of extrapyramidal system dysfunction and tardive dyskinesia
- b) In having low affinity for  $D_1$  and  $D_2$  dopamine receptors
- c) In having high affinity for  $D_4$  dopamine receptors
- d) All of the above**

011. Tardive dyskinesia is the result of:

- a) Degeneration of dopaminergic and cholinergic fibers
- b) Hyperactive dopaminergic state in the presence of dopamine blockers**
- c) Degeneration of histaminergic fibers
- d) Supersensitivity of cholinergic receptors in the caudate-putamen

012. Which of the following antipsychotic drugs has high affinity for D<sub>4</sub> and 5-HT<sub>2</sub> receptors?

- a) **Clozapine**
- b) Fluphenazine
- c) Thioridazine
- d) Haloperidole

013. Indicate the antipsychotic drug, which is a phenothiazine aliphatic derivative:

- a) Thiothixene
- b) Risperidone
- c) **Chlorpromazine**
- d) Clozapine

014. Indicate the antipsychotic drug, which is a butyrophenone derivative:

- a) **Droperidol**
- b) Thioridazine
- c) Sertindole
- d) Fluphenazine

015. Indicate the antipsychotic drug, which is a thioxanthene derivative:

- a) Haloperidol
- b) Clozapine
- c) Chlorpromazine
- d) **Thiothixene**

016. Indicate the antipsychotic agent – a dibenzodiazepine derivative:

- a) Fluphenazine
- b) **Clozapine**
- c) Risperidone
- d) Droperidol

017. The strong antiemetic effect of the phenothiazine derivatives is due to dopamine receptor blockade:

- a) In the chemoreceptor trigger zone of the medulla
- b) Of the receptors in the stomach
- c) The medullar vomiting centre
- d) **All of the above**

018. Phenothiazine derivatives are able to:

- a) **Alter temperature-regulating mechanisms producing hypothermia**
- b) Decrease levels of prolactin
- c) Increase corticotrophin release and secretion of pituitary growth hormone
- d) Decrease appetite and weight

019. Most phenothiazine derivatives have:

- a) Antihistaminic activity
- b) Anticholinergic activity
- c) Antidopaminergic activity
- d) **All of the above**

020. Indicate the antipsychotic drug having significant peripheral alpha-adrenergic blocking activity:

- a) Haloperidol
- b) **Chlorpromazine**
- c) Clozapine
- d) Risperidone

021. Indicate the antipsychotic drug having a muscarinic-cholinergic blocking activity:

- a) **Chlorpromazine**
- b) Clorprothixene
- c) Risperidone
- d) Haloperidol

022. Indicate the antipsychotic drug having H<sub>1</sub>-antihistaminic activity:

- a) Clozapine
- b) Chlorpromazine
- c) Olanzapine
- d) **All of the above**

023. Parkinson's syndrome, acute dystonic reactions, tardive dyskinesia, antimuscarinic actions, orthostatic hypotension, galactorrhea are possible adverse effects of:

- a) Haloperidol
- b) Clozapine
- c) **Chlorpromazine**
- d) Risperidone

024. Orthostatic hypotension can occur as a result of:

- a) The central action of phenothiazines
- b) Inhibition of norepinephrine uptake mechanisms
- c) Alpha adrenoreceptor blockade
- d) All of the above**

025. Adverse peripheral effects, such as loss of accommodation, dry mouth, tachycardia, urinary retention, constipation are related to:

- a) Alpha adrenoreceptor blockade
- b) Muscarinic cholinoreceptor blockade**
- c) Supersensitivity of the dopamine receptor
- d) Dopamine receptor blockade

026. Which of the following phenothiazine derivatives is a potent local anesthetic?

- a) Fluphenazine
- b) Thioridazine
- c) Chlorpromazine**
- d) None of the above

027. Which of the following phenothiazine derivatives may produce cardiac toxicity, including ventricular arrhythmias, cardiac conduction block, and sudden death?

- a) Thioridazine**
- b) Chlorpromazine
- c) Perphenazine
- d) Fluphenazine

028. Which of the following antipsychotic agents is preferable in patients with coronary and cerebrovascular disease?

- a) Chlorpromazine
- b) Fluphenazine
- c) Haloperidol**
- d) Perphenazine

029. Which of the following antipsychotic agents is used in combination with an opioid drug fentanyl in neuroleptanalgesia?

- a) Haloperidol
- b) Droperidol**
- c) Chlorpromazine
- d) Clozapine

030. The mechanism of haloperidol antipsychotic action is:

- a) Blocking D<sub>2</sub> receptors
- b) Central alpha-adrenergic blocking
- c) Inhibition of norepinephrine uptake mechanisms
- d) All of the above**

031. Which of the following statements is correct for clozapine?

- a) Has potent anticholinergic activity**
- b) Has high affinity for D<sub>1</sub> and D<sub>2</sub> dopamine receptors
- c) Produces significant extrapyramidal toxicity
- d) Is related to typical antipsychotic agents

032. Which of the following antipsychotic drugs has the high risk of potentially fatal agranulocytosis and risk of seizures at high doses?

- a) Haloperidol
- b) Risperidone
- c) Clozapine**
- d) Chlorpromazine

033. Which of the following antipsychotic drugs has high affinity for D<sub>2</sub> and 5-HT<sub>2</sub> receptors?

- a) Droperidol
- b) Clozapine
- c) Thiothixene
- d) Risperidone**

034. Lithium carbonate is useful in the treatment of:

- a) Petit mal seizures
- b) Bipolar disorder**
- c) Neurosis
- d) Trigeminal neuralgia

035. The drug of choice for manic-depressive psychosis is:

- a) Imipramine
- b) Chlordiazepoxide**

c) Isocarboxazid

**d) Lithium carbonate**

036. The lithium mode of action is:

- a) Effect on electrolytes and ion transport
- b) Effect on neurotransmitters
- c) Effect on second messengers
- d) All of the above**

037. Which of the following statements is correct for lithium?

- a) Stimulate dopamine and beta-adrenergic receptors
- b) Decrease catecholamine-related activity**
- c) Stimulate the development of dopamine receptor supersensitivity
- d) Decrease cholinergic activity

038. Which of the following adverse effects is associated with lithium treatment?

- a) Cardiovascular anomalies in the newborn
- b) Thyroid enlargement
- c) Nephrogenic diabetes insipidus
- d) All of the above**

#### **PART VIII Antidepressant agents**

001. The principal mechanism of action of antidepressant agents is:

- a) Stabilization of dopamine and beta-adrenergic receptors
- b) Inhibition of the storage of serotonin and epinephrine in the vesicles of presynaptic nerve endings
- c) Blocking epinephrine or serotonin reuptake pumps**
- d) Stimulation of  $\alpha_2$ -norepinephrine receptors

002. Which of the following agents is related to tricyclic antidepressants?

- a) Nefazodon
- b) Amitriptyline**
- c) Fluoxetine
- d) Isocarboxazid

003. Indicate the second-generation heterocyclic drug:

- a) Maprotiline**
- b) Imipramine
- c) Phenelzine
- d) Fluoxetine

004. Which of the following agents is related to the third-generation heterocyclic antidepressants?

- a) Amitriptyline
- b) Maprotiline
- c) Nefazodone**
- d) Tranylcypromine

005. Which of the following antidepressants is a selective serotonin reuptake inhibitor?

- a) Phenelzine
- b) Desipramine
- c) Maprotiline
- d) Fluoxetine**

006. Which of the following antidepressant agents is a selective inhibitor of norepinephrine reuptake?

- a) Fluvoxamine
- b) Maprotiline**
- c) Amitriptyline
- d) Tranylcypromine

007. Indicate the antidepressant, which blocks the reuptake pumps for serotonin and norepinephrine:

- a) Amitriptyline**
- b) Fluoxetine
- c) Maprotiline
- d) Phenelzine

008. Which of the following antidepressants is an unselective MAO blocker and produces extremely long-lasting inhibition of the enzyme?

- a) Moclobemide
- b) Tranylcypromine**
- c) Selegiline
- d) Fluoxetine

009. Indicate the irreversible MAO inhibitor, which is a hydrazide derivative:

- Moclobemide
- Selegiline
- Tranylcypromine
- Phenelzine**

010. Which of the following MAO inhibitors has amphetamine-like activity and is related to nonhydrazide derivatives:

- Phenelzine
- Moclobemide
- Tranylcypromine**
- All of the above

011. Which of the following antidepressants is a selective short-acting MAO-A inhibitor?

- Maprotiline
- Amitriptyline
- Moclobemide**
- Selegiline

012. Monoamine Oxydase A:

- Is responsible for norepinephrine, serotonin, and tyramine metabolism**
- Is more selective for dopamine
- Metabolizes norepinephrine and dopamine
- Deaminates dopamine and serotonin

013. Which synapses are involved in depression?

- Dopaminergic synapses
- Serotonergic synapses**
- Cholinergic synapses
- All of the above

014. Block of which type of Monoamine Oxydase might be more selective for depression?

- MAO-A**
- MAO-B
- Both MAO-A and MAO-B
- MAO-C

015. The principal mechanism of MAO inhibitor action is:

- Blocking the amine reuptake pumps, which permits to increase the concentration of the neurotransmitter at the receptor site
- Blocking a major degradative pathway for the amine neurotransmitters, which permits more amines to accumulate in presynaptic stores**
- Inhibition the storage of amine neurotransmitters in the vesicles of presynaptic nerve endings
- Antagonism of  $\alpha_2$ -norepinephrine receptors

016. The irreversible MAO inhibitors have a very high risk of developing:

- Respiratory depression
- Cardiovascular collapse and CNS depression
- Hypertensive reactions to tyramine ingested in food**
- Potentially fatal agranulocytosis

017. The most dangerous pharmacodynamic interaction is between MAO inhibitors and:

- Selective serotonin reuptake inhibitors
- Tricyclics
- Sympathomimetics
- All of the above**

018. Serotonin syndrome is a result of:

- Increased stores of monoamine
- Significant accumulation of amine neurotransmitters in the synapses
- Both a and b**
- Depleted stores of biogenic amines

019. The therapeutic response to antidepressant drugs is usually over a period of:

- 2-3 days
- 2-3 weeks**
- 24 hours
- 2-3 month

020. Which of the following antidepressants may have latency period as short as 48 hours?

- Tranylcypromine**
- Imipramine
- Fluoxetine

d) Amitriptyline

021. Which of the following features do MAO inhibitors and tricyclic antidepressants have in common?

- Act postsynaptically to produce their effect
- Can precipitate hypotensive crises if certain foods are ingested
- Increase levels of biogenic amines**
- Are useful for the manic phase of bipolar disorder

022. Tricyclic antidepressants are:

- Highly selective serotonin reuptake inhibitors
- Monoamine oxidase inhibitors
- Selective norepinephrine reuptake inhibitors
- Mixed norepinephrine and serotonin reuptake inhibitors**

023. Which of the following autonomic nervous system effects is common for tricyclic antidepressants?

- Antimuscarinic action
- Antihistaminic action
- Alfa adrenoreceptor-blocking action
- All of the above**

024. Indicate an effective antidepressant with minimal autonomic toxicity:

- Amitriptyline
- Fluoxetine**
- Imipramine
- Doxepin

025. Fluoxetine has fewer adverse effects because of:

- Mixed norepinephrine and serotonin reuptake inhibition
- Depleted stores of amine neurotransmitters
- Minimal binding to cholinergic, histaminic, and alfa-adrenergic receptors**
- All of the above

026. Which of the following tricyclic and heterocyclic antidepressants has the greatest sedation?

- Doxepin
- Amitriptyline
- Trazodone
- All of the above**

027. Which of the following tricyclic and heterocyclic agents has the least sedation?

- Protriptyline
- Trazodone
- Amitriptyline
- Mirtazapine

028. Indicate a tricyclic or a heterocyclic antidepressant having greatest antimuscarinic effects:

- Desipramine
- Amitriptyline**
- Trazodone
- Mirtazapine

029. Indicate a tricyclic or a heterocyclic antidepressant having least antimuscarinic effects:

- Trazodone
- Bupropion
- Mirtazapine
- All of the above**

030. Which of the following antidepressants has significant alfa<sub>2</sub>-adrenoreceptor antagonism?

- Amitriptyline
- Nefazodone
- Mirtazapine**
- Doxepin

031. Indicate the main claim for an ideal antidepressant agent:

- A faster onset of action
- Fewer adverse sedative and autonomic effects
- Fewer toxicity when overdoses are taken
- All of the above**

032. Sedation, peripheral atropine-like toxicity (e.g. Cycloplegia, tachycardia, urinary retention, and constipation), orthostatic hypotension, arrhythmias, weight gain and sexual disturbances are possible adverse effects of:

- Sertaline
- Amitriptyline**
- Phenelsine

d) Bupropion

033. Which of the following drugs is least likely to be prescribed to patients with prostatic hypertrophy, glaucoma, coronary and cerebrovascular disease?

a) **Amitriptyline**  
 b) Paroxetine  
 c) Bupropion  
 d) Fluoxetine

034. Indicate the antidepressant agent, which is a phenyltolylpropylamine derivative:

a) Paroxetine  
 b) Maprotiline  
 c) **Fluoxetine**  
 d) Amitriptyline

035. The mechanism of fluoxetine action includes:

a) Selective inhibition of serotonin uptake in the CNS  
 b) Little effect on central norepinephrine or dopamine function  
 c) Minimal binding to cholinergic, histaminic, and alfa-adrenergic receptors  
 d) **All of the above**

036. Which of the following antidepressants is used for treatment of eating disorders, especially bulimia?

a) Amitriptyline  
 b) **Fluoxetine**  
 c) Imipramine  
 d) Tranylcypromine

037. Sertaline and paroxetine are similar to fluoxetine in the mechanism of action and therapeutic use, sertaline is less likely to interact adversely with other drugs.

a) **True**  
 b) False

038. A highly selective serotonin reuptake inhibitor is:

a) Sertaline  
 b) Paroxetine  
 c) Fluoxetine  
 d) **All of the above**

**PART IX Anxiolytic agents**

001. Anxiolytics are used to treat:

a) **Neurosis**  
 b) Psychosis  
 c) Narcolepsy  
 d) Bipolar disorders

002. Anxiolytic agents should:

a) Relieve pain  
 b) **Reduce anxiety and exert a calming effect**  
 c) Improve mood and behavior in patient with psychotic symptoms  
 d) Produce drowsiness, encourage the onset and maintenance of a state of sleep

003. Anxiolytics are also useful for:

a) Treatment of epilepsy and seizures  
 b) Insomnia  
 c) Muscle relaxation in specific neuromuscular disorders  
 d) **All of the above**

004. Indicate the agents of choice in the treatment of most anxiety states:

a) Barbiturates  
 b) **Benzodiazepines**  
 c) Lithium salts  
 d) Phenothiazines

005. The choice of benzodiazepines for anxiety is based on:

a) A relatively high therapeutic index  
 b) Availability of flumazenil for treatment of overdose  
 c) A low risk of physiologic dependence  
 d) **All of the above**

006. Which of the following anxiolitics is a benzodiazepine derivative:

a) Buspirone

b) **Clordiazepoxide**  
c) Meprobamate  
d) Chloral hydrate

**007.** Indicate the benzodiazepine, which has the shortest elimination half-life:  
a) Quazepam  
**b) Triazolam**  
c) Diazepam  
d) Clorazepate

**008.** Which of the following benzodiazepines has the shortest duration of action?  
**a) Triazolam**  
b) Clorazepate  
c) Prazepam  
d) Clordiazepoxide

**009.** Which of the following benzodiazepines is less likely to cause cumulative and residual effects with multiple doses?  
a) Clorazepate  
b) Quazepam  
**c) Lorazepam**  
d) Prazepam

**010.** Anxiolytic dosage reduction is recommended:  
a) In patients taking cimetidine  
b) In patients with hepatic dysfunction  
c) In elderly patients  
**d) All of the above**

**011.** Which of the following benzodiazepines is preferred for elderly patients?  
a) Clorazepate  
b) Clordiazepoxide  
**c) Triazolam**  
d) Prazepam

**012.** Which of the following anxiolytics is preferred in patient with limited hepatic function?  
**a) Buspiron**  
b) Quazepam  
c) Diazepam  
d) Chlordiazepoxide

**013.** Indicate the mechanism of hypnotic benzodiazepine action:  
a) Increasing the duration of the GABA-gated  $\text{Cl}^-$  channel openings  
b) Directly activating the chloride channels  
**c) Increasing the frequency of  $\text{Cl}^-$  channel opening events**  
d) All of the above

**014.** Which of the following anxiolytics is a partial agonist of brain  $5\text{-HT}_{1A}$  receptors?  
**a) Buspiron**  
b) Alprozolam  
c) Chlorazepat  
d) Lorazepam

**015.** Indicate the competitive antagonist of BZ receptors:  
**a) Flumazenil**  
b) Buspirone  
c) Picrotoxin  
d) Diazepam

**016.** Indicate the agent, which interferes with GABA binding:  
a) Chlordiazepoxide  
**b) Bicuculline**  
c) Thiopental  
d) Picrotoxin

**017.** Antianxiety agents have:  
a) Sedative and hypnotic activity  
b) Muscle relaxing and anticonvulsant effects  
c) Amnesic properties  
**d) All of the above**

**018.** Which of the following disadvantages does not limit using benzodiazepines as antianxiety agents?  
a) Tendency to develop psychologic dependence  
**b) A high risk of drug interactions based on liver enzyme induction**

c) Synergic CNS depression with concomitant use of other drugs  
 d) The formation of active metabolites

019. Indicate the anxiolitic agent, which relieves anxiety without causing marked sedative effects:  
 a) Diazepam  
 b) Chlordiazepoxid  
**c) Buspirone**  
 d) Clorazepate

020. Which of the following anxiolytics has minimal abuse liability?  
 a) Oxazepam  
**b) Buspirone**  
 c) Flumazenil  
 d) Alprazolam

021. In contrast to benzodiazepines, buspirone:  
 a) Interact directly with gabaergic system  
 b) Has more marked hypnotic, anticonvulsant, or muscle relaxant properties  
**c) Causes less psychomotor impairment and does not affect driving skills**  
 d) Has maximal abuse liability

022. Which of the following sedative-hypnotic drugs does not potentiate the CNS depressant effects of ethanol, phenothiazines, or tricyclic antidepressants?  
**a) Buspirone**  
 b) Phenobarbital  
 c) Diazepam  
 d) Chloralhydrate

023. Limitation of buspirone is:  
 a) A low therapeutic index  
**b) An extremely slow onset of action**  
 c) A high potential of development of physical dependence  
 d) Impairment of mentation or motor functions during working hours

024. Which drugs may be used as antianxiety agents?  
 a) BETA-blocking drugs  
 b) Clonidine - a partial agonist of alfa<sub>2</sub> receptors  
 c) Tricyclic antidepressants  
**d) All of the above**

025. Which of the following benzodiazepines is more likely to cause "hangover" effects such as drowsiness, dysphoria, and mental or motor depression the following day?  
 a) Oxazepam  
 b) Triazolam  
**c) Clorazepat**  
 d) Lorazepam

026. Additive CNS depression can be predicted if benzodiazepines are used with:  
 a) Ethanol  
 b) Morphine  
 c) Clorpromazine  
**d) All of the above**

027. Which dosage of benzodiazepines for 60-90 days may produce severe withdrawal symptoms?  
**a) 50-60 mg/d**  
 b) Less than 400 mg/d  
 c) More than 800 mg/d  
 d) Less than 40 mg/d

028. Restlessness, anxiety, orthostatic hypotension, generalized seizures, severe tremor, vivid hallucination, and psychosis are possible symptoms of:  
 a) Tolerance  
**b) Withdrawal**  
 c) Drug interactions between barbiturate and diazepam  
 d) None of the above

029. Flumazenil is used to:  
 a) Reverse the CNS depressant effects of hypnotic benzodiazepines overdose  
 b) Hasten recovery following use of hypnotic benzodiazepines in anesthetic and diagnostic procedure  
 c) Reverse benzodiazepine-induced respiratory depression  
**d) All of the above**

030. Flumazenil given intravenously:

- a) Has intermediate onset and duration of action about 2 hours
- b) Acts rapidly but has a short half-life**
- c) Has an effect lasting 3-5 hours
- d) Has duration of action longer than 6 hours

**PART X CNS stimulants**

001. Agents, stimulating CNS are all of the following except:

- a) Fluoxetine
- b) Clozapine**
- c) Nootropil
- d) Sydnocarb

002. Which of the following CNS stimulants are the agents of selective effect?

- a) Analeptics
- b) General tonics
- c) Psychostimulants**
- d) Actoprotectors

003. Indicate CNC stimulating drugs, which are the agents of general action:

- a) Nootropic agents
- b) Analeptics**
- c) Psychostimulants
- d) Antidepressants

004. Which of the following agents belongs to psychostimulants?

- a) Meridil**
- b) Camphor
- c) Piracetam
- d) Pantocrin

005. Indicate the nootropic agent:

- a) Sydnocarb
- b) Eleuterococci extract
- c) Fluoxetine
- d) Piracetam**

006. Which of the following agents is a respiratory analeptic?

- a) Piracetam
- b) Sydnocarb
- c) Bemegride**
- d) Pantocrin

007. Indicate the CNC stimulating drug, which belongs to adaptogens:

- a) Amphetamine
- b) Eleuterococci extract**
- c) Caffeine
- d) Sydnocarb

008. Actoprotectors are:

- a) Stimulators, improving physical efficiency**
- b) Cognition enhancers, improving the highest integrative brain function
- c) Stimulants, raising non-specific resistance towards stresses
- d) Agents, stimulating the bulbar respiratory and vasomotor centers

009. Adaptogens cause:

- a) Improvement of efficiency using physical loads and acceleration of recovery after the load
- b) Stimulation of respiratory and vasomotor centers
- c) Temporary relief of the feeling of tiredness, facilitating the professional work and fighting somnolence
- d) Increased resistance towards stress situations and adaptation to extreme conditions**

010. Indicate the CNS stimulants, which mitigate conditions of weakness or lack of tone within the entire organism or in particular organs?

- a) Psychostimulants
- b) Analeptics
- c) General tonics**
- d) Antidepressants

011. Which of the following agents is a general tone-increasing drug of plant origin?

- a) Meridil
- b) Eleuterococci's extract**
- c) Pantocrin

d) Caffeine

**012.** Indicate a general tone-increasing drug, which is an agent of animal origin?

- Pantocrin**
- Amphetamine
- Sydnocarb
- Camphor

**013.** Amphetamine:

- Is a powerful stimulant of the CNS
- Stimulates the medullar respiratory center and has an analeptic action
- Increases motor and speech activity, mood, decreases a sense of fatigue
- All of the above**

**014.** The mechanism of amphetamine action is related to:

- Direct catecholameric agonist action
- Inhibition of monoamine oxidase
- Increasing a release of catecholaminergic neurotransmitters
- All of the above**

**015.** Indicate the CNS stimulant, which is a piperidine derivative:

- Meridil**
- Amphetamine
- Caffeine
- Sydnophen

**016.** Which of the following CNS psychostimulants is a sydnonymine derivative?

- Caffeine
- Sydnocarb**
- Meridil (methylphenidate hydrochloride)
- Amphetamine

**017.** Sydnocarb causes:

- Decreased sense of fatigue, it facilitates the professional work and fights somnolence**
- The feeling of prosperity, relaxation and euphoria
- Influx of physical and mental forces, locomotive and speech excitation
- Peripheral sympathomimetic action

**018.** Indicate the psychostimulant, which is a methylxantine derivative:

- Caffeine**
- Sydnocarb
- Amphetamine
- Meridil

**019.** Which of the following psychostimulants acts centrally mainly by blocking adenosine receptors?

- Meridil
- Caffeine**
- Amphetamine
- Sydnophen

**020.** Principal properties of caffeine include all of the following EXCEPT:

- Cardiac analeptic (increase the rate and the force of the cardiac contraction)
- Adaptogenic (rise non-specific resistance towards stresses and adapt to extraordinary challenges)**
- Psychoanaleptic (decrease the feeling of tiredness, facilitates the professional work and fights somnolence)
- Respiratory analeptic (stimulate the bulbar respiratory center)

**021.** Caffeine can produce all of the following effects except:

- Coronary vasodilation
- Relaxation of bronchial and biliary tract smooth muscles
- Vasodilation of cerebral vessels**
- Reinforcement of the contractions and increase of the striated muscle work

**022.** Caffeine does not cause:

- Inhibition of gastric secretion**
- Hyperglycemia
- Moderate diuretic action
- Increase in free fatty acids

**023.** Therapeutic uses of caffeine include all of the following EXCEPT:

- Cardiovascular collapse and respiratory insufficiency
- Migraine
- Somnolence
- Gastric ulceration**

024. Adverse effects of caffeine include all of the following EXCEPT:

- a) Arrhythmias
- b) Insomnia
- c) Hypotension**
- d) Psychomotor excitation

025. Principal properties of cordiamine include all of the following EXCEPT:

- a) Cardiac analeptic
- b) Respiratory analeptic
- c) Coronarodilatator
- d) Significant abuse potential**

026. Characteristics of cordiamine include all of the following EXCEPT:

- a) It stimulates the CNS and facilitates the movement coordination
- b) It is a respiratory analeptic of mixed action (stimulates both the medullar respiratory center and chemoreceptor of carotid sinus zone)
- c) It decreases the aortic and coronary flow**
- d) It counteracts the central depression produced by other drugs (barbiturates)

027. Cordiamine is useful in the treatment of:

- a) Hypotension
- b) Coronary insufficiency
- c) Respiratory insufficiency
- d) All of the above**

028. Respiratory and cardiac analeptics are all of the following agents EXCEPT:

- a) Cordiamine
- b) Bemegride**
- c) Caffeine
- d) Camphor

029. Bemegride:

- a) Stimulates the medullar respiratory center (central effect)**
- b) Stimulates hemoreceptors of carotid sinus zone (reflector action)
- c) Is a mixed agent (both central and reflector effects)
- d) Is a spinal analeptic

030. Which of the following CNS stimulants belongs to nootropics?

- a) Camphor
- b) Pantocrin
- c) Sydnone
- d) Piracetam**

031. Characteristics of nootropics include all of the following EXCEPT:

- a) Selective influence on the brain
- b) Improvement the ability to communicate with peers
- c) Decline in the highest integrative brain functions**
- d) Increase in energetic exchange of the brain cells

032. Which of the following statements concerning nootropics is not correct?

- a) They improve the highest integrative brain functions (memory, learning, understanding, thinking and the capacity for concentration)
- b) They stimulate the bulbar respiratory center**
- c) They stimulate existing neuronal synapses to optimum performance (adaptive capacity)
- d) They stimulate existing neuronal synapses to damaging influences, such as disturbances of the energy and neurotransmitter metabolism or ischemia (protective capacity)

033. Features of piracetam include all of the following EXCEPT:

- a) It is a GABA derivative
- b) It does not influence the neuro-vegetative function
- c) Improvement begins in the 3'rd week
- d) It has a high potential of toxicity**

034. Piracetam can produce all of the following effects EXCEPT:

- a) Antipsychotic**
- b) Anticonvulsant
- c) Psychometabolic
- d) Antihypoxic

035. Piracetam is widely used for the treatment of:

- a) Senile dementia
- b) Asthenia

- c) Chronic alcoholism
- d) All of the above**

036. Indicate the CNS stimulant, which is used in pediatric medicine, as it improves the communication with the child, increases the ability to study and communication with peers, improves school-performance?

- a) Meridil
- b) Piracetam**
- c) Bemegride
- d) Amphetamine

037. Which of the following CNS stimulants is used for the cerebral stroke treatment?

- a) Pantocrin
- b) Sydnocarb
- c) Piracetam**
- d) Caffeine

#### **PART XI Drugs of abuse**

001. Psychologic dependence is:

- a) Decreased responsiveness to a drug following repeated exposure
- b) A combination of certain drug-specific symptoms that occur on sudden discontinuation of a drug
- c) Compulsive drug-seeking behavior**
- d) All of the above

002. Tolerance is associated with:

- a) An ability to compensate for the drug effect
- b) Increased disposition of the drug after chronic use
- c) Compensatory changes in receptors, effector enzymes, or membrane actions of the drug
- d) All of the above**

003. Addiction is associated with the existence of:

- a) Psychological dependence
- b) Physiological dependence
- c) Tolerance
- d) All of the above**

004. Substances causing narco- and glue sniffings are all of the following EXCEPT :

- a) Stimulants
- b) Antipsychotic drugs**
- c) Psychedelics
- d) Sedative drugs

005. Which of the following abused drugs do not belong to sedative agents?

- a) Barbiturates
- b) Tranquilizers
- c) Cannabinoids**
- d) Opioids

006. Psychedelics are all of following agents EXCEPT:

- a) Cocaine**
- b) LSD
- c) Marijuana
- d) Volatile substances (glues, solvents, volatile nitrites and nitrous oxide)

007. In contrast to morphine, heroin is:

- a) Used clinically
- b) More addictive and fast-acting**
- c) More effective orally
- d) Less potent and long-acting

008. Symptoms of opioid withdrawal begin 8-10 hours after the last dose.

- a) True**
- b) False

009. The acute course of opioid withdrawal may last:

- a) 3-4 days
- b) 7-10 days**
- c) 3-4 weeks
- d) 26-30 weeks

010. Indicate the sedative-hypnotic agent, which has the highest abuse potential:

- a) Buspirone

b) Diazepam  
**c) Phenobarbital**  
 d) Zolpidem

**011.** Characteristics of barbiturate intoxication (2-3 dose) include all of the following EXCEPT:  
 a) Pleasant feelings of the “blow” in the head, vertigo, myasthenia, stupor  
**b) Perceptual distortion of surroundings, disorders of thinking, behavior**  
 c) Locomotive, speech excitation, sharp swings from a cheerful mood to an aggressive state  
 d) Sleep with the subsequent weakness and headaches

**012.** Barbiturate abstinency syndrome is shown by:  
 a) Crisis by 3 day of abstention  
 b) Anxiety, mydriasis, myasthenia, muscular convulsions, vomiting, diarrhea  
 c) Psychosis as delirium (color visual and auditory hallucinations)  
**d) All of the above**

**013.** Which one of the following tranquilizers belongs to strong euphorizing agents?  
 a) Mebicarum  
 b) Buspirone  
**c) Diazepam**  
 d) Chlordiazepoxide

**014.** Tranquilizers intoxication (5-10 tablets) features include:  
 a) **Euphoria, burst of energy, increase in motor activity, wave warmth all over the body**  
 b) Visual hallucinations, a distorted feeling of time and space  
 c) Physical bliss, body lightness, a wish to fly, motionlessness  
 d) Synesthesia (the sounds can be tensed, the colors can be heard)

**015.** Which of the following abused drugs is related to stimulants?  
 a) Cocaine  
 b) Amphetamine  
 c) Caffeine  
**d) All of the above**

**016.** Cocaine exerts its central action by:  
 a) Inhibiting phosphodiesterase  
 b) Increasing a release of catecholaminergic neurotransmitters, including dopamine  
**c) Inhibiting dopamine and norepinephrine reuptake**  
 d) Altering serotonin turnover

**017.** “Crack” is a derivative of:  
 a) Opium  
 b) LSD  
**c) Cocaine**  
 d) Cannabis

**018.** Cocaine intoxication appears by:  
 a) Short clouding of consciousness, lightness of body and a feeling of flight  
 b) Wave warmth all over the body, physical bliss, motionlessness  
 c) Clear consciousness, improved mood, influx of physical and spiritual forces, locomotive and speech excitation, reappraisal of personality  
**d) All of the above**

**019.** Which of the following stimulants is related to psychedelics?  
**a) “ecstasy” (methylenedioxymethamphetamine)**  
 b) Cocaine  
 c) “crack” (cocaine free base)  
 d) Caffeine

**020.** Cocaine may cause:  
 a) Powerful vasoconstrictive reactions resulting in myocardial infarctions  
 b) The multiple brain perfusion defects  
 c) Spontaneous abortion during pregnancy  
**d) All of the above**

**021.** Characteristics of cocaine abstinency syndrome include all of the following phases EXCEPT:  
 a) Feeling of depression, irritability, confusion, insomnia (the first 3 days)  
 b) Depression, apathy, excessive appetite, a wish to sleep (the subsequent 1-2 days)  
**c) Psychosis as color visual and auditory hallucinations (for 3 day)**  
 d) New attack of depression, anxiety, irritability, dullness, intense thirst for cocaine (after 1-5 days improvement)

**022.** Overdoses of cocaine are usually rapidly fatal from:  
 a) Respiratory depression

- b) Arrhythmias
- c) Seizures
- d) All of the above**

023. Which of the following agents is related to hallucinogens?

- a) Heroin
- b) LSD**
- c) Cocaine
- d) Opium

024. LSD produces:

- a) Mood swings
- b) Impaired memory, difficulty in thinking, poor judgment
- c) Perceptual distortion
- d) All of the above**

025. LSD decreases in brain:

- a) 5-HT<sub>2</sub> receptor densities**
- b) GABA<sub>A</sub>-benzodiazepine receptor densities
- c) Adrenergic receptor densities
- d) D<sub>2</sub> receptor densities

026. Which of the following agents is related to cannabis?

- a) Heroin
- b) Ecstasy
- c) Hashish**
- d) Crack

027. The early stage of cannabis intoxication is characterized by:

- a) Euphoria, uncontrolled laughter
- b) Alteration of time sense, depersonalization
- c) Sharpened vision
- d) All of the above**

028. Which of the following physiologic signs is a characteristic of cannabis intoxication?

- a) Bradycardia
- b) Reddening of the conjunctiva**
- c) Miosis
- d) Nausea and vomiting

029. Industrial solvent inhalation causes:

- a) Quick intoxication, lasting only 5-15 minutes
- b) Euphoria, relaxed "drunk" feeling
- c) Disorientation, slow passage of time and possible hallucinations
- d) All of the above**

030. Indicate the drugs of choice for reversing the withdrawal syndrome:

- a) Benzodiazepines
- b) Neuroleptics
- c) Antidepressants
- d) All of the above**

#### **PART XII General anesthetics**

001. The state of "general anesthesia" usually includes:

- a) Analgesia
- b) Loss of consciousness, inhibition of sensory and autonomic reflexes
- c) Amnesia
- d) All of the above**

002. Inhaled anesthetics and intravenous agents having general anesthetic properties:

- a) Directly activate GABA<sub>A</sub> receptors**
- b) Facilitate GABA action but have no direct action on GABA<sub>A</sub> receptors
- c) Reduce the excitatory glutamatergic neurotransmission
- d) Increase the duration of opening of nicotine-activated potassium channels

003. Indicate the anesthetic, which is an inhibitor of NMDA glutamate receptors:

- a) Thiopental
- b) Halothane
- c) Ketamine**
- d) Sevoflurane

004. An ideal anesthetic drug would:

- a) Induces anesthesia smoothly and rapidly and secure rapid recovery
- b) Posses a wide margin of safety
- c) Be devoid of adverse effects
- d) All of the above**

005. Which of the following general anesthetics belongs to inhalants?

- a) Thiopental
- b) Desflurane**
- c) Ketamine
- d) Propofol

006. Indicate the anesthetic, which is used intravenously:

- a) Propofol**
- b) Halothane
- c) Desflurane
- d) Nitrous oxide

007. Which of the following inhalants is a gas anesthetic?

- a) Halothane
- b) Isoflurane
- c) Nitrous oxide**
- d) Desflurane

008. Sevoflurane has largely replaced halothane and isoflurane as an inhalation anesthetic of choice because:

- a) Induction of anesthesia is achieved more rapidly and smoothly
- b) Recovery is more rapid
- c) It has low post- anesthetic organ toxicity
- d) All of the above**

009. The limitation of sevoflurane is:

- a) High incidence of coughing and laryngospasm
- b) Chemically unstable**
- c) Centrally mediated sympathetic activation leading to a rise of BP and HR
- d) Hepatotoxicity

010. Which of the following inhalants lacks sufficient potency to produce surgical anesthesia by itself and therefore is commonly used with another inhaled or intravenous anesthetic?

- a) Halothane
- b) Sevoflurane
- c) Nitrous oxide**
- d) Desflurane

011. Which of the following inhaled anesthetics has rapid onset and recovery?

- a) Nitrous oxide
- b) Desflurane
- c) Sevoflurane
- d) All of the above**

012. Indicate the inhaled anesthetic, which reduces arterial pressure and heart rate:

- a) Isoflurane
- b) Halothane**
- c) Desflurane
- d) Nitrous oxide

013. Which of the following inhaled anesthetics causes centrally mediated sympathetic activation leading to a rise in blood pressure and heart rate?

- a) Desflurane**
- b) Sevoflurane
- c) Nitrous oxide
- d) Isoflurane

014. Indicated the inhaled anesthetic, which decreases the ventilatory response to hypoxia:

- a) Sevoflurane
- b) Nitrous oxide**
- c) Desflurane
- d) Halothane

015. Which of the following inhaled anesthetics is an induction agent of choice in patient with airway problems?

- a) Desfurane
- b) Nitrous oxide
- c) Halothane**

d) None of the above

**016.** Indicate the inhaled anesthetic, which causes the airway irritation:

- Nitrous oxide
- Sevoflurane
- Halothane
- Desflurane**

**017.** Which of the following inhaled anesthetics increases cerebral blood flow least of all?

- Sevoflurane
- Nitrous oxide**
- Isoflurane
- Desflurane

**018.** Indicate the inhaled anesthetic, which should be avoided in patients with a history of seizure disorders:

- Enflurane**
- Nitrous oxide
- Sevoflurane
- Desflurane

**019.** Which of the following inhaled anesthetics can produce hepatic necrosis?

- Sofeflurane
- Desflurane
- Halothane**
- Nitrous oxide

**020.** Indicated the inhaled anesthetic, which may cause nephrotoxicity:

- Halothane
- Sofeflurane**
- Nitrous oxide
- Diethyl ether

**021.** Which of the following inhaled anesthetics decreases methionine synthase activity and causes megaloblastic anemia?

- Desflurane
- Halothane
- Nitrous oxide**
- Sofeflurane

**022.** Unlike inhaled anesthetics, intravenous agents such as thiopental, etomidate, and propofol:

- Have a faster onset and rate of recovery
- Provide a state of conscious sedation
- Are commonly used for induction of anesthesia
- All of the above**

**023.** Indicate the intravenous anesthetic, which is an ultra-short-acting barbiturate:

- Fentanyl
- Thiopental**
- Midazolam
- Ketamine

**024.** Indicate the intravenous anesthetic, which is a benzodiazepine derivative:

- Midazolam**
- Thiopental
- Ketamin
- Propofol

**025.** Which of the following agents is used to accelerate recovery from the sedative actions of intravenous benzodiazepines?

- Naloxone
- Flumazenil**
- Ketamine
- Fomepizole

**026.** Neuroleptanalgesia has all of the following properties EXCEPT:

- Dropidol and fentanyl are commonly used
- It can be used with nitrous oxide to provide neuroleptanesthesia
- Hypertension is a common consequence**
- Confusion and mental depression can occur as adverse effects

**027.** Which of the following intravenous anesthetics has antiemetic actions?

- Thiopental
- Propofol**
- Ketamine
- Fentanyl

028. Indicate the intravenous anesthetic, which causes minimal cardiovascular and respiratory depressant effects:

- a) Propofol
- b) Thiopental
- c) Etomidate**
- d) Midazolam

029. Indicate the intravenous anesthetic, which produces dissociative anesthesia:

- a) Midazolam
- b) Ketamine**
- c) Fentanyl
- d) Thiopental

030. Ketamine anesthesia is associated with:

- a) Cardiovascular stimulation
- b) Increased cerebral blood flow, oxygen consumption and intracranial pressure
- c) Disorientation, sensory and perceptual illusions, and vivid dreams following anesthesia
- d) All of the above**

(4) *ORGANOTROPIC AGENTS*

**PART I Drugs acting on respiratory system**

001. Following drugs directly activate the respiratory center EXCEPT:

- a) Bemegride
- b) Caffeine
- c) Aethylmorphine
- d) Cytiton**

002. The mechanism of Cytiton action is:

- a) Direct activation of the respiratory center
- b) The reflex mechanism**
- c) The mixed mechanism
- d) None of the above

003. Indicate the drug belonging to antitussives of narcotic type of action:

- a) Glaucine hydrochloride
- b) Aethylmorphine hydrochloride**
- c) Tusuprex
- d) Libexine

004. Tick out the drug belonging to non-narcotic antitussives:

- a) Libexine
- b) Tusuprex**
- c) Codeine
- d) Aethylmorphine hydrochloride

005. Indicate the expectorant with the reflex mechanism:

- a) Sodium benzoate
- b) Derivatives of Ipecacucnha and Thermopsis**
- c) Trypsin
- d) Ambroxol

006. Tick the antitussive agent with a peripheral effect:

- a) Codeine
- b) Tusuprex
- c) Libexine**
- d) Glaucine hydrochloride

007. Chymotrypsin is an agent containing free sulphydryl groups. It's:

- a) True
- b) False**

008. All of these drugs contain free sulphydryl groups EXCEPT:

- a) Acetylcysteine
- b) Ambroxol
- c) Bromhexin
- d) Trypsin**

009. Which of the following drugs is proteolytic enzyme?

- a) Potassium iodide
- b) Desoxiribonuclease**
- c) Carbocysteine

d) Acetylcysteine

010. All of the following drugs destroy disulfide bonds of proteoglycans, which causes depolymerization and reduction of viscosity of sputum, EXCEPT:

- Acetylcysteine
- Ambroxol
- Desoxiribonuclease**
- Bromhexin

011. Which of these groups of drugs is used for asthma treatment?

- Methylxanthines
- M-cholinoblocking agents
- Beta<sub>2</sub>- stimulants
- All of above**

012. Tick the drug belonging to non-selective beta<sub>2</sub>-adrenomimics:

- Salbutamol
- Isoprenaline**
- Salmeterol
- Terbutaline

013. Select the side-effect characteristic for non-selective beta<sub>2</sub>-adrenomimics:

- Depression of the breathing centre
- Tachycardia**
- Peripheral vasoconstriction
- Dry mouth

014. Pick out the bronchodilator drug related to xanthine:

- Atropine
- Orciprenaline
- Adrenaline
- Theophylline**

015. Pick out the bronchodilator drug belonging to sympathomimics:

- Isoprenaline
- Ephedrine**
- Atropine
- Salbutamol

016. The property of prolonged theophyllines is the prevention of night asthmatic attacks. It's:

- True**
- False

017. The mechanism of methylxanthines action is:

- Inhibition of the enzyme phosphodiesterase**
- Beta<sub>2</sub>-adrenoreceptor stimulation
- Inhibition of the production of inflammatory cytokines
- Inhibition of M-cholinoreceptors

018. Which of the following M-cholinoblocking agents is used especially as an anti-asthmatic?

- Atropine
- Ipratropium**
- Platiphylline
- Metacin

019. Indicate the side effect of Theophylline:

- Bradycardia
- Increased myocardial demands for oxygen**
- Depression of respiratory centre
- Elevation of the arterial blood pressure

020. All of the following drugs are inhaled glucocorticoids EXCEPT:

- Triamcinolone
- Beclometazone
- Sodium cromoglycate**
- Budesonide

021. Choose the drug belonging to membranestabilizing agents:

- Zileutin
- Sodium cromoglycate**
- Zafirlucast
- Montelucast

022. Tick the drug which is a 5-lipoxygenase inhibitor:

- a) Budesonide
- b) Sodium cromoglycate
- c) Zileutin**
- d) Beclometazone

023. Zileutin prevents the production of leukotrienes. This statement is:

- a) True**
- b) False

024. Indicate the drug which is a leucotriene receptor antagonist:

- a) Sodium cromoglycate
- b) Zafirlucast**
- c) Zileutin
- d) Triamcinolone

025. Zafirlucast prevents aspirin-sensitive asthma. This consideration is:

- a) True**
- b) False

***PART II Drugs used in gastrointestinal diseases***

001. Tick the main approach of peptic ulcer treatment:

- a) Neutralization of gastric acid
- b) Eradication of Helicobacter pylori
- c) Inhibition of gastric acid secretion
- d) All the above**

002. Gastric acid secretion is under the control of the following agents EXCEPT:

- a) Histamine
- b) Acetylcholine
- c) Serotonin**
- d) Gastrin

003. Indicate the drug belonging to proton pump inhibitors:

- a) Pirenzepine
- b) Ranitidine
- c) Omeprazole**
- d) Trimethaphan

004. All of the following agents intensify the secretion of gastric glands EXCEPT:

- a) Pepsin**
- b) Gastrin
- c) Histamine
- d) Carbonate mineral waters

005. Which of the following drugs is an agent of substitution therapy?

- a) Gastrin
- b) Hydrochloric acid**
- c) Hystamine
- d) Carbonate mineral waters

006. Choose the drug which is a H2-receptor antagonist:

- a) Omeprazole
- b) Pirenzepine
- c) Carbenoxolone
- d) Ranitidine**

007. All of the following drugs are proton pump inhibitors EXCEPT:

- a) Pantoprazole
- b) Omeprazole
- c) Famotidine**
- d) Rabeprazole

008. Indicate the drug belonging to M1-cholinoblockers:

- a) Cimetidine
- b) Ranitidine
- c) Pirenzepine**
- d) Omeprazole

009. Which of the following drugs may cause reversible gynecomastia?

- a) Omeprazole
- b) Pirenzepine

**c) Cimetidine**  
d) Sucralfate

**010.** Cimetidine has no effect on hepatic drug metabolism. It's  
 a) True  
**b) False**

**011.** Tick the drug forming a physical barrier to HCL and Pepsin:  
 a) Ranitidine  
**b) Sucralfate**  
 c) Omeprazole  
 d) Pirenzepine

**012.** Which drug is an analog of prostaglandin E<sub>1</sub>?  
**a) Misoprostole**  
 b) De-nol  
 c) Sucralfate  
 d) Omeprazole

**013.** Select the drug stimulating the protective function of the mucous barrier and the stability of the mucous membrane against damaging factors:  
 a) De-nol  
 b) Sucralfate  
**c) Misoprostol**  
 d) Omeprazole

**014.** Antacids are weak bases that react with gastric hydrochloric acid to form salt and water. It's  
**a) True**  
 b) False

**015.** Most of drugs are antacids EXCEPT:  
**a) Misoprostol**  
 b) Maalox  
 c) Mylanta  
 d) Almagel

**016.** Indicate the drug that cause metabolic alkalosis:  
**a) Sodium bicarbonate**  
 b) Cimetidine  
 c) Pepto-Bismol  
 d) Carbenoxolone

**017.** Choose the drug that causes constipation:  
 a) Sodium bicarbonate  
**b) Aluminium hydroxide**  
 c) Calcium carbonate  
 d) Magnesium oxide

**018.** All of the following drugs stimulate appetite EXCEPT:  
 a) Vitamins  
 b) Bitters  
**c) Fepranone**  
 d) Insulin

**019.** Ethyl alcohol is an agent decreasing appetite. It's:  
 a) True  
**b) False**

**020.** Select an anorexigenic agent affecting serotonergic system:  
**a) Fenfluramine**  
 b) Fepranone  
 c) Desopimone  
 d) Masindole

**021.** All of the following drugs intensify gastrointestinal motility EXCEPT:  
**a) Papaverine**  
 b) Metoclopramide  
 c) Domperidone  
 d) Cisapride

**022.** Metoclopramide is a potent dopamine antagonist. It's  
**a) True**  
 b) False

023. Choose an emetic drug of central action:

- a) Ipecacuanha derivatives
- b) Promethazine
- c) Tropisetron
- d) Apomorphine hydrochloride**

024. Tick the mechanism of Metoclopramide antiemetic action:

- a)  $H_1$  and  $H_2$ -receptor blocking effect
- b) M-cholinoreceptor stimulating effect
- c)  $D_2$ -dopamine and 5-HT<sub>3</sub>-serotonin receptor blocking effect**
- d) M-cholinoblocking effect

025. Select the emetic agent having a reflex action:

- a) Ipecacuanha derivatives**
- b) Apomorphine hydrochloride
- c) Chlorpromazine
- d) Metoclopramide

026. All of the following drugs are antiemetics EXCEPT:

- a) Metoclopramide
- b) Ondansetron
- c) Chlorpromazine
- d) Apomorphine hydrochloride**

027. Indicate an antiemetic agent which is related to neuroleptics:

- a) Metoclopramide
- b) Nabilone
- c) Tropisetron
- d) Prochlorperazine**

028. All of these drugs reduce intestinal peristalsis EXCEPT:

- a) Loperamide
- b) Cisapride**
- c) Methyl cellulose
- d) Magnesium aluminium silicate

029. Indicate the laxative drug belonging to osmotic laxatives:

- a) Docusate sodium
- b) Bisacodyl
- c) Phenolphthalein
- d) Sodium phosphate**

030. The mechanism of stimulant purgatives is:

- a) Increasing the volume of non-absorbable solid residue
- b) Increasing motility and secretion**
- c) Altering the consistency of the feces
- d) Increasing the water content

031. Choose the drug irritating the gut and causing increased peristalsis:

- a) Phenolphthalein**
- b) Methyl cellulose
- c) Proserine
- d) Mineral oil

032. All of the following drugs stimulate bile production and bile secretion EXCEPT:

- a) Chenodiol**
- b) Cholenszyme
- c) Oxaphenamide
- d) Cholosas

033. Tick the stimulant of bile production of vegetable origin:

- a) Oxaphenamide
- b) Papaverine
- c) Cholenzyme
- d) Cholosas**

034. Select the drug which inhibits peristalsis:

- a) Castor oil
- b) Bisacodyl
- c) Loperamide**
- d) Sorbitol

035. Choose the drug affecting the biliary system and relaxing Oddi sphincter:

- a) Cholosas
- b) Oxaphenamide
- c) **No-spa**
- d) Cholenzyme

**PART III Drugs acting on hematopoietic system**

001. Following drugs stimulate erythropoiesis EXCEPT:

- a) Iron dextran
- b) Vitamine B<sub>12</sub>
- c) **Methotrexate**
- d) Folic acid

002. Choose the drug depressing erythropoiesis:

- a) **Radioactive phosphorus 32**
- b) Ferrous sulfate
- c) Molgramostim
- d) Folic acid

003. Which drug does not influence leucopoiesis?

- a) Filgrastim
- b) **Erythropoetin**
- c) Doxorubicin
- d) Methotrexate

004. Iron deficiency anemia leads to pallor, fatigue, dizziness, exertional dyspnea and other symptoms of tissue ischemia. It's:

- a) **True**
- b) False

005. All of the following drugs used for iron deficiency anemia EXCEPT:

- a) Ferrous sulfate
- b) **Folic acid**
- c) Ferrous gluconate
- d) Ferrous fumarate

006. Tick the drug for parenteral iron therapy:

- a) Ferrous sulfate
- b) **Fercoven**
- c) Ferrous lactate
- d) Ferrous fumarate

007. Indicate the drug which increases absorption of iron from intestine:

- a) Cyanocobalamin
- b) Folic acid
- c) **Ascorbic acid**
- d) Erythropoetin

008. The drugs used for oral administration EXCLUDE:

- a) Ferrous sulfate
- b) **Fercoven**
- c) Ferrous lactate
- d) Ferrous fumarate

009. Pernicious anemia is developed due to deficiency of:

- a) Erythropoetin
- b) **Vitamin B<sub>12</sub>**
- c) Iron
- d) Vitamin B<sub>6</sub>

010. Select the drug used for pernicious anemia:

- a) Ferrous lactate
- b) **Cyanocobalamin**
- c) Iron dextran
- d) Ferrous gluconate

011. An adverse effect of oral iron therapy is:

- a) Anemia
- b) Thrombocytopenia
- c) Headache
- d) **Constipation**

012. Choose the drug which contains cobalt atom:

- a) Folic acid
- b) Iron dextran
- c) Cyanocobalamin**
- d) Ferrous gluconate

013. Tick the drug used in aplastic anemia:

- a) Fercoven
- b) Cyanocobalamin
- c) Epoetin alpha**
- d) Folic acid

014. Folic acid is recommended for treatment of megaloblastic anemia. This statement is:

- a) True**
- b) False

015. Select the drug of granulocyte colony-stimulating factor:

- a) Filgrastim**
- b) Methotrexate
- c) Erythropoetin
- d) Doxorubicin

#### **PART IV Drugs used in disorders of coagulation**

001. All of the following physiologic reactions are involved in the control of bleeding EXCEPT:

- a) Platelet adhesion reaction
- b) Platelet release reaction
- c) Activation of the antifibrinolytic system**
- d) Triggering of the coagulation process

002. Which of the following substances is synthesized within vessel walls and inhibits thrombogenesis?

- a) Thromboxane A<sub>2</sub> (TXA<sub>2</sub>)
- b) Prostacyclin (PGI<sub>2</sub>)**
- c) Prostaglandin ((PGE)
- d) None of the above

003. All of the following groups of drugs are for thrombosis treatment EXCEPT:

- a) Anticoagulant drugs
- b) Antifibrinolytic drugs**
- c) Fibrinolytic drugs
- d) Antiplatelet drugs

004. Pick out the drug belonging to anticoagulants of direct action:

- a) Aspirin
- b) Heparin**
- c) Dicumarol
- d) Phenprocoumon

005. Which of the following drugs has low-molecular weight?

- a) Dicumarol
- b) Enoxaparin**
- c) Phenprocoumon
- d) Heparin

006. Indicate the drug belonging to antagonists of heparin:

- a) Aspirin
- b) Dicumarol
- c) Dalteparin
- d) Protamine sulfate**

007. Tick the drug used as an oral anticoagulant:

- a) Heparin
- b) Dalteparin
- c) Dicumarol**
- d) Enoxaparin

008. All of the following drugs are indirect acting anticoagulants EXCEPT:

- a) Dicumarol
- b) Warfarin
- c) Dalteparin**
- d) Phenindione

009. Which of the following drugs belongs to coumarin derivatives?

a) Heparin  
 b) Enoxaparin  
 c) Dalteparin  
**d) Warfarin**

**010.** Heparin is effective when administered orally. This consideration is:  
 a) True  
**b) False**

**011.** All of these drugs are antiplatelet agents EXCEPT:  
 a) Aspirin  
**b) Urokinase**  
 c) Ticlopidine  
 d) Clopidogrel

**012.** The use of heparin is recommended for treatment of deep venous thrombosis. This statement is:  
**a) True**  
 b) False

**013.** Mechanism of aspirin action is:  
 a) Converts inactive plasminogen into active plasmin  
**b) Inhibits COX and thus thromboxane synthesis**  
 c) Enhances the interaction between antitrombin III and both thrombin and the factors involved in the intrinsic clotting cascade  
 d) Inhibits the glycoprotein IIb/IIIa complex

**014.** Which doses of Aspirin may be more effective in inhibiting Thromboxane A<sub>2</sub>?  
**a) Low**  
 b) High

**015.** Which of the following drugs is an inhibitor of platelet glycoprotein IIb/IIIa receptors?  
 a) Aspirin  
 b) Clopidogrel  
 c) Ticlopidine  
**d) Abciximab**

**016.** Ticlopidine is an inhibitor of ADP-induced platelet aggregation. It's:  
**a) True**  
 b) False

**017.** Which of the following drugs is fibrinolytic?  
 a) Ticlopidine  
**b) Streptokinase**  
 c) Aspirin  
 d) Warfarin

**018.** Mechanism of urokinase action is an inhibition of Thromboxane A<sub>2</sub>. This statement is:  
 a) True  
**b) False**

**019.** Fibrinolytic drugs are used for following EXCEPT:  
 a) Central deep venous thrombosis  
 b) Multiple pulmonary emboli  
**c) Heart failure**  
 d) Acute myocardial infarction

**020.** Indicate the drug belonging to fibrinolytic inhibitors:  
**a) Aminocapronic acid**  
 b) Ticlopidine  
 c) Streptokinase  
 d) Vitamin K

**021.** Aminocapronic acid is a drug of choice for treatment of:  
 a) Acute myocardial infarction  
**b) Bleeding from fibrinolytic therapy**  
 c) Heart failure  
 d) Multiple pulmonary emboli

**022.** Tranexamic acid is an analog of aminocapronic acid. It's:  
**a) True**  
 b) False

**PART V Drugs used for treatment of heart failure**

**001.** All of the following are normally involved in the pathogenesis of heart failure EXCEPT:

- a) A cardiac lesion that impairs cardiac output
- b) An increase in peripheral vascular resistance
- c) A decrease in preload**
- d) An increase in sodium and water retention

**002.** All of the following are compensatory mechanisms that occur during the pathogenesis of congestive heart failure EXCEPT:

- a) An increase in ventricular end-diastolic volume
- b) An increase in the concentration of plasma catecholamines
- c) An increase in vagal tone**
- d) Increased activity of the renin-angiotensin-aldosterone system

**003.** All of the following are recommended at the initial stages of treating patients with heart failure EXCEPT:

- a) Reduced salt intake
- b) Verapamil**
- c) ACE inhibitors
- d) Diuretics

**004.** All of the following agents belong to cardiac glycosides EXCEPT:

- a) Digoxin
- b) Strophanthidin K
- c) Amrinone**
- d) Digitoxin

**005.** The non-glycoside positive inotropic drug is:

- a) Digoxin
- b) Strophanthidin K
- c) Dobutamine**
- d) Digitoxin

**006.** Sugar molecules in the structure of glycosides influence:

- a) Cardiotonic action
- b) Pharmacokinetic properties**
- c) Toxic properties
- d) All of the above

**007.** Aglycone is essential for:

- a) Plasma protein binding
- b) Half-life
- c) Cardiotonic action**
- d) Metabolism

**008.** Choose the derivative of the plant Foxglove (Digitalis):

- a) Digoxin**
- b) Strophanthidin K
- c) Dobutamine
- d) Amrinone

**009.** All of the following statements regarding cardiac glycosides are true EXCEPT:

- a) They inhibit the Na<sup>+</sup>/K<sup>+</sup>-ATPase and thereby increase intracellular Ca<sup>++</sup> in myocardial cells
- b) They cause a decrease in vagal tone**
- c) Children tolerate higher doses of digitalis than do adults
- d) The most frequent cause of digitalis intoxication is concurrent administration of diuretics that deplete K<sup>+</sup>

**010.** An important action of digitalis is to increase vagal tone. It's:

- a) True**
- b) False

**011.** Digoxin is thought to increase intracellular concentrations of calcium in myocardial cells by indirectly slowing the action of the sodium-calcium exchanger. This consideration is:

- a) True**
- b) False

**012.** Compare the half-life of digoxin and the half-life of digitoxin:

- a) Digoxin is greater than digitoxin
- b) Digitoxin is greater than digoxin**

**013.** All of the following statements regarding cardiac glycosides are true EXCEPT:

- a) They inhibit the activity of the Na<sup>+</sup>/K<sup>+</sup>-ATPase
- b) They decrease intracellular concentrations of calcium in myocytes**

c) They increase vagal tone  
 d) They have a very low therapeutic index

**014.** All of the following statements regarding cardiac glycosides are true EXCEPT:

- Digoxin is a mild inotrope
- Digoxin increases vagal tone
- Digoxin has a longer half-life than digitoxin**
- Digoxin acts by inhibiting the Na<sup>+</sup>/K<sup>+</sup> ATPase

**015.** The most cardiac manifestation of glycosides intoxication is:

- Atrioventricular junctional rhythm
- Second-degree atrioventricular blockade
- Ventricular tachycardia
- All the above**

**016.** The manifestations of glycosides intoxication are:

- Visual changes
- Ventricular tachyarrhythmias
- Gastrointestinal disturbances
- All the above**

**017.** For digitalis-induced arrhythmias the following drug is favored:

- Verapamil
- Amiodarone
- Lidocaine**
- Propanolol

**018.** In very severe digitalis intoxication the best choice is to use:

- Lidocaine
- Digibind (Digoxin immune fab)**
- Oral potassium supplementation
- Reducing the dose of the drug

**019.** All of the following statements regarding cardiac glycoside-induced ventricular tachyarrhythmias are true EXCEPT:

- Lidocaine is a drug of choice in treatment
- Digibind should be used in life-threatening cases
- They occur more frequently in patients with hyperkalemia than in those with hypokalemia**
- They are more likely to occur in patients with a severely damaged heart

**020.** This drug is a selective beta-1 agonist:

- Digoxin
- Dobutamine**
- Amrinone
- Dopamine

**021.** Tolerance to this inotropic drug develops after a few days:

- Amrinone
- Amiodarone
- Dobutamine**
- Adenosine

**022.** This drug inhibits breakdown of cAMP in vascular smooth muscle:

- Digoxin
- Dobutamine
- Amrinone**
- Dopamine

**023.** This drug is useful for treating heart failure because it increases the inotropic state and reduces afterload:

- Amiodarone
- Amrinone**
- Propanolol
- Enalapril

**024.** This drug acts by inhibiting type III cyclic nucleotide phosphodiesterase:

- Amiodarone
- Milrinone**
- Propanolol
- Enalapril

**025.** All of the following statements regarding inhibitors of type III phosphodiesterase are true EXCEPT:

- They raise cAMP concentrations in cardiac myocytes
- They reduce afterload
- They show significant cross-tolerance with beta-receptor agonists**

d) They are associated with a significant risk for cardiac arrhythmias

**026.** All of the following drugs are used in the treatment of severe congestive heart failure EXCEPT:

- Verapamil**
- Digoxin
- Dobutamine
- Dopamine

**027.** Drugs most commonly used in chronic heart failure are:

- Cardiac glycosides
- Diuretics
- Angiotensin-converting enzyme inhibitors
- All the above**

**028.** All of the following statements concerning angiotensin converting enzyme (ACE) inhibitors are true EXCEPT:

- They act by inhibiting the ability of renin to convert angiotensinogen to angiotensin I.**
- Enalapril is a prodrug that is converted to an active metabolite
- They reduce secretion of aldosterone
- They can produce hyperkalemia in combination with a potassium-sparing diuretic

**029.** All of the following effects of ACE inhibitors may be useful in treating heart failure EXCEPT:

- They decrease afterload
- They increase circulating catecholamine levels**
- They reduce reactive myocardial hypertrophy
- They increase myocardial beta-1 adrenergic receptor density

**030.** All of the following statements concerning the use of angiotensin-converting enzyme (ACE) inhibitors in the treatment of heart failure are true EXCEPT:

- They improve hemodynamics by decreasing afterload
- They can increase plasma cholesterol levels**
- They may slow the progression of heart failure by preventing myocardial and vascular remodeling
- They are effective first-line agents in the treatment of chronic heart failure

**PART VI Antiarrhythmic agents**

**001.** This drug is a Class IA antiarrhythmic drug:

- Sotalol
- Propranolol
- Verapamil
- Quinidine**

**002.** This drug is a Class IC antiarrhythmic drug:

- Flecainide
- Sotalol
- Lidocaine**
- Verapamil

**003.** This drug is a Class IC antiarrhythmic drug:

- Flecainide**
- Sotalol
- Lidocaine
- Verapamil

**004.** This drug is a Class II antiarrhythmic drug:

- Flecainide
- Propranolol**
- Lidocaine
- Verapamil

**005.** This drug is a Class III antiarrhythmic drug:

- Flecainide
- Sotalol**
- Lidocaine
- Verapamil

**006.** This drug prolongs repolarization:

- Flecainide
- Sotalol**
- Lidocaine
- Verapamil

**007.** This drug is a Class IV antiarrhythmic drug:

a) Flecainide  
 b) Sotalol  
 c) Lidocaine  
**d) Verapamil**

008. This drug is used in treating supraventricular tachycardias:  
**a) Digoxin**  
 b) Dobutamine  
 c) Amrinone  
 d) Dopamine

009. This drug is associated with Torsades de pointes.  
 a) Flecainide  
**b) Sotalol**  
 c) Lidocaine  
 d) Verapamil

010. This drug has beta-adrenergic blocking activity:  
 a) Flecainide  
**b) Sotalol**  
 c) Lidocaine  
 d) Verapamil

011. This drug is useful in terminating atrial but not ventricular tachycardias:  
 a) Flecainide  
 b) Sotalol  
 c) Lidocaine  
**d) Verapamil**

012. This is a drug of choice for acute treatment of ventricular tachycardias:  
 a) Flecainide  
 b) Sotalol  
**c) Lidocaine**  
 d) Verapamil

013. The calcium channel blockers have direct negative inotropic effects because they reduce the inward movement of calcium during the action potential. This consideration is:  
**a) True**  
 b) False

014. Common unwanted effects of the dihydropyridines are due to vasodilation. It's:  
**a) True**  
 b) False

015. Verapamil is a more potent vasodilator than nifedipine. This statement is:  
 a) True  
**b) False**

016. This drug is contraindicated in patients with moderate to severe heart failure:  
 a) Nifedipine  
**b) Verapamil**  
 c) Both of the above  
 d) None of the above

017. This drug is an effective bronchodilator:  
 a) Nifedipine  
 b) Verapamil  
 c) Both of the above.  
**d) None of the above**

018. This drug is used intravenously to terminate supraventricular tachycardias:  
 a) Nifedipine  
**b) Verapamil**  
 c) Both of the above  
 d) None of the above

019. This drug has a little or no direct effect on chronotropy and dromotropy at normal doses  
**a) Nifedipine**  
 b) Diltiazem  
 c) Verapamil  
 d) All of the above

020. Verapamil has a significant effect on automaticity in the SA node. It's:

- a) True
- b) False

021. This drug acts by inhibiting slow calcium channels in the SA and AV nodes:

- a) Quinidine
- b) Adenosine
- c) Flecainide
- d) **Diltiazem**

022. All of the following statements regarding verapamil are true EXCEPT:

- a) It blocks L-type calcium channels
- b) **It increases heart rate**
- c) It relaxes coronary artery smooth muscle
- d) It depresses cardiac contractility

023. All of the following calcium channel blockers are useful in the treatment of cardiac arrhythmias EXCEPT:

- a) Bepridil
- b) Diltiazem
- c) Verapamil
- d) **Nifedipine**

024. All of the following are common adverse effects of calcium channel blockers EXCEPT:

- a) **Skeletal muscle weakness**
- b) Dizziness
- c) Headache
- d) Flushing

025. Tick the adverse reactions characteristic for lidocaine:

- a) Agranulocytosis, leucopenia
- b) Extrapyramidal disorders
- c) **Hypotension, paresthesias, convulsions**
- d) Bronchospasm, dyspepsia

#### **PART VII Drugs for Angina Pectoris treatment**

001. Angina pectoris is:

- a) **Severe constricting chest pain, often radiating from the precordium to the left shoulder and down the arm, due to insufficient blood supply to the heart that is usually caused by coronary disease**
- b) An often fatal form of arrhythmia characterized by rapid, irregular fibrillar twitching of the ventricles of the heart instead of normal contractions, resulting in a loss of pulse
- c) The cardiovascular condition in which the heart ability to pump blood weakens
- d) All of the above

002. All these drug groups useful in angina both decrease myocardial oxygen requirement (by decreasing the determinations of oxygen demand) and increase myocardial oxygen delivery (by reversing coronary arterial spasm), EXCEPT:

- a) Nitrates and nitrite drugs (Nitroglycerin, Isosorbide dinitrate)
- b) Calcium channel blockers (Nifedipine, Nimodipine)
- c) **Beta-adrenoceptor-blocking drugs (Atenolol, Metoprolol)**
- d) Potassium channel openers (Minoxidil)

003. This drug group useful in angina decreases myocardial oxygen requirement (by decreasing the determinations of oxygen demand) and does not increase myocardial oxygen delivery (by reversing coronary arterial spasm):

- a) Nitrates and nitrite drugs (Nitroglycerin, Isosorbide dinitrate)
- b) Myotropic coronary dilators (Dipyridamole)
- c) Potassium channel openers (Minoxidil)
- d) **Beta-adrenoceptor-blocking drugs (Atenolol, Metoprolol)**

004. This drug group useful in angina increase myocardial oxygen delivery (by reversing coronary arterial spasm) and does not decrease myocardial oxygen requirement (by decreasing the determinations of oxygen demand):

- a) Beta-adrenoceptor-blocking drugs (Atenolol, Metoprolol):
- b) **Myotropic coronary dilators (Dipyridamole)**
- c) Calcium channel blockers (Nifedipine, Nimodipine)
- d) Potassium channel openers (Minoxidil)

005. Which of the following statements concerning nitrate mechanism of action is True?

- a) Therapeutically active agents in this group are capable of releasing nitric oxide (NO) in to vascular smooth muscle target tissues
- b) Nitric oxide (NO) is an effective activator of soluble guanylyl cyclase and probably acts mainly through this mechanism
- c) Nitrates useful in angina decrease myocardial oxygen requirement (by decreasing the determinations of oxygen demand) and increase myocardial oxygen delivery (by reversing coronary arterial spasm)
- d) **All of the above**

006. Which of the following nitrates and nitrite drugs are long-acting?

- a) Nitroglycerin, sublingual
- b) Isosorbide dinitrate, sublingual (Isordil, Sorbitrate)
- c) Amyl nitrite, inhalant (Aspirols, Vaporole)
- d) Sustac**

007. Which of the following nitrates and nitrite drugs is a short-acting drug?

- a) Nitroglycerin, 2% ointment (Nitrol)
- b) Nitroglycerin, oral sustained-release (Nitrong)
- c) Amyl nitrite, inhalant (Aspirols, Vaporole)**
- d) Sustac

008. Which of the following nitrates and nitrite drugs is used for prevention of angina attack?

- a) Nitroglycerin, 2% ointment (Nitrol)
- b) Nitroglycerin, oral sustained-release (Nitrong)
- c) Isosorbide mononitrate (Ismo)
- d) All of the above**

009. Duration of nitroglycerin action (sublingual) is:

- a) 10-30 minutes**
- b) 6-8 hours
- c) 3-5 minutes
- d) 1.5-2 hours

010. The following statements concerning mechanism of nitrate beneficial clinical effect are true, EXCEPT?

- a) Decreased myocardial oxygen requirement
- b) Relief of coronary artery spasm
- c) Improved perfusion to ischemic myocardium
- d) Increased myocardial oxygen consumption**

011. Side effect of nitrates and nitrite drugs are, EXCEPT:

- a) Orthostatic hypotension, tachycardia
- b) GI disturbance**
- c) Throbbing headache
- d) Tolerance

012. The following statements concerning mechanism of calcium channel blockers' action are true, EXCEPT:

- a) Therapeutically active agents in this group are capable of releasing nitric oxide (NO) in vascular smooth muscle target tissues**
- b) Calcium channel blockers bind to L-type calcium channel sites
- c) Calcium channel blockers useful in angina decrease myocardial oxygen requirement (by decreasing the determinants of oxygen demand) and increase myocardial oxygen delivery (by reversing coronary arterial spasm)
- d) Calcium channel blockers decrease transmembrane calcium current associated in smooth muscle with long-lasting relaxation and in a cardiac muscle with a reduction in contractility

013. Which of the following antianginal agents is a calcium channel blocker?

- a) Nitroglycerin
- b) Dipyridamole
- c) Minoxidil
- d) Nifedipine**

014. Which of the following cardiovascular system effects refers to a calcium channel blocker?

- a) The reduction of peripheral vascular resistance
- b) The reduction of cardiac contractility and, in some cases, cardiac output
- c) Relief of coronary artery spasm
- d) All of the above**

015. Main clinical use of calcium channel blockers is:

- a) Angina pectoris
- b) Hypertension
- c) Supraventricular tachyarrhythmias
- d) All of the above**

016. Which of the following antianginal agents is a myotropic coronary dilator:

- a) Dipyridamole**
- b) Validol
- c) Atenolol
- d) Alinidine

017. Which of the following antianginal agents is a beta-adrenoceptor-blocking drug:

- a) Dipyridamole
- b) Validol**

**c) Atenolol**  
**d) Alinidine**

**018.** The following agents are cardioselective beta1-adrenoceptor-blocking drugs labeled for use in angina, EXCEPT:

a) Metoprolol  
b) Talinolol  
c) Atenolol  
**d) Propranolol**

**019.** Which of the following statements concerning beta-adrenoceptor-blocking drugs are true:

a) These agents decrease transmembrane calcium current associated in a smooth muscle with long-lasting relaxation and in a cardiac muscle with a reduction in contractility  
b) These agents has a moderate reflex and vascular dilative action caused by the stimulation of sensitive nerve endings  
**c) Beneficial effects of these agents are related primarily to their hemodynamic effects – decreased heart rate, blood pressure, and contractility – which decrease myocardial oxygen requirements at rest and during exercise**  
d) These agents increase the permeability of K channels, probably ATP-dependent K channels, that results in stabilizing the membrane potential of excitable cells near the resting potential

**020.** Which of the following antianginal agents refers to reflex coronary dilators:

a) Dipyridamole  
**b) Validol**  
c) Atenolol  
d) Alinidine

**021.** Which of the following statements concerning Validol is true:

a) Validol has a moderate reflex and vascular dilative action caused by the stimulation of sensitive nerve endings  
b) At sublingual administration the effect is produced in five minutes and 70 % of the preparation is released in 3 minutes  
c) It is used in cases of angina pectoris, motion sickness, nausea, vomiting when seasick or airsick and headaches due to taking nitrates  
**d) All of the above**

**022.** Which of the following antianginal agents is the specific bradycardic drug:

a) Dipyridamole  
b) Validol  
c) Atenolol  
**d) Alinidine**

**023.** Following statements concerning specific bradycardic agents (Falipamil, Alinidine) are true, EXCEPT:

**a) Bradycardic drugs have a moderate reflex and vascular dilative action caused by the stimulation of sensitive nerve endings**  
b) The predominant effect of bradycardic drugs is a decrease in heart rate without significant changes in arterial pressure  
c) The protective effect of bradycardic drugs is likely due to a reduced O<sub>2</sub> demand  
d) Specific bradycardic agents are used in the management of a wide range of cardiovascular disorders, including sinus tachyarrhythmias and angina pectoris

**024.** Which of the following statements concerning Dipyridamole is true?

a) Dipyridamole is an agent that blocks the reabsorption and breakdown of adenosine that results in an increase of endogenous adenosine and vasodilatation  
b) The drug causes relative hypoperfusion of myocardial regions served by coronary arteries with haemodynamically significant stenoses  
c) Dipyridamole is a platelet aggregation inhibitor  
**d) All of the above**

**025.** Which of the following antianginal agents is a potassium channel opener:

a) Dipyridamole  
b) Validol  
c) Atenolol  
**d) Minoxidil**

**026.** Which of the following statements concerning potassium channel openers is true?

a) These agents decrease transmembrane calcium current associated in a smooth muscle with long-lasting relaxation and in a cardiac muscle with a reduction in contractility  
b) These agents has a moderate reflex and vascular dilative action caused by the stimulation of sensitive nerve endings  
c) Beneficial effects of these agents are related primarily to their hemodynamic effects – decreased heart rate, blood pressure, and contractility – which decrease myocardial oxygen requirements at rest and during exercise  
**d) These agents increase the permeability of K channels, probably ATP-dependent K channels, that results in stabilizing the membrane potential of excitable cells near the resting potential**

**PART VIII Antihypertensive drugs**

001. This drug reduces blood pressure by acting on vasomotor centers in the CNS:  
 a) Labetalol  
**b) Clonidine**  
 c) Enalapril  
 d) Nifedipine

002. All of the following are central acting antihypertensive drugs EXCEPT:  
 a) Metyldopa  
 b) Clonidine  
 c) Moxonidine  
**d) Minoxidil**

003. A ganglioblocking drug for hypertension treatment is:  
 a) Hydralazine  
 b) Tubocurarine  
**c) Trimethaphan**  
 d) Metoprolol

004. Pick out the sympatholytic drug:  
 a) Labetalol  
 b) Prazosin  
**c) Guanethidine**  
 d) Clonidine

005. Tick the drug with nonselective beta-adrenoblocking activity:  
 a) Atenolol  
**b) Propranolol**  
 c) Metoprolol  
 d) Nebivolol

006. Choose the selective blocker of beta-1 adrenoreceptors:  
 a) Labetalol  
 b) Prazosin  
**c) Atenolol**  
 d) Propranolol

007. Pick out the drug – an alpha and beta adrenoreceptors blocker:  
**a) Labetalol**  
 b) Verapamil  
 c) Nifedipine  
 d) Metoprolol

008. This drug inhibits the angiotensin-converting enzyme:  
 a) Captopril  
 b) Enalapril  
 c) Ramipril  
**d) All of the above**

009. This drug is a directly acting vasodilator:  
 a) Labetalol  
 b) Clonidine  
 c) Enalapril  
**d) Nifedipine**

010. Pick out the diuretic agent for hypertension treatment:  
 a) Losartan  
**b) Dichlothiazide**  
 c) Captopril  
 d) Prazosin

011. This drug blocks alpha-1 adrenergic receptors:  
**a) Prazosin**  
 b) Clonidine  
 c) Enalapril  
 d) Nifedipine

012. This drug activates alpha-2 adrenergic receptors:  
 a) Labetalol  
 b) Phentolamine  
**c) Clonidine**  
 d) Enalapril

013. This drug is an inhibitor of renin synthesis:

- a) **Propranolol**
- b) Enalapril
- c) Diazoxide
- d) Losartan

014. This drug is a non-peptide angiotensin II receptor antagonist:

- a) Clonidine
- b) Captopril
- c) **Losartan**
- d) Diazoxide

015. This drug is a potassium channel activator:

- a) Nifedipine
- b) Saralasin
- c) **Diazoxide**
- d) Losartan

016. All of the following statements regarding angiotensin II are true EXCEPT:

- a) It is a peptide hormone
- b) It stimulates the secretion of aldosterone
- c) **Angiotensin I is almost as potent as angiotensin II**
- d) It is a potent vasoconstrictor

017. This drug is contraindicated in patients with bronchial asthma:

- a) **Propranolol**
- b) Clonidine
- c) Enalapril
- d) Nifedipine

018. This drug is converted to an active metabolite after absorption:

- a) Labetalol
- b) Clonidine
- c) **Enalapril**
- d) Nifedipine

019. This drug routinely produces some tachycardia:

- a) Propranolol
- b) Clonidine
- c) Enalapril
- d) **Nifedipine**

020. All of the following statements regarding vasodilators are true EXCEPT:

- a) Hydralazine causes tachycardia
- b) **Nifedipine is a dopamine receptor antagonist**
- c) Nitroprusside dilates both arterioles and veins
- d) Minoxidil can cause hypertrichosis

021. All of the following statements regarding verapamil are true EXCEPT:

- a) It blocks L-type calcium channels
- b) **It increases heart rate**
- c) It relaxes coronary artery smooth muscle
- d) It depresses cardiac contractility

022. Choose the unwanted effects of clonidine:

- a) Parkinson's syndrome
- b) **Sedative and hypnotic effects**
- c) Agranulocytosis and aplastic anemia
- d) Dry cough and respiratory depression

023. The reason of beta-blockers administration for hypertension treatment is:

- a) Peripheral vasodilatation
- b) Diminishing of blood volume
- c) **Decreasing of heart work**
- d) Depression of vasomotor center

024. An endogenous vasoconstrictor that can stimulate aldosterone release from suprarenal glands:

- a) Angiotensinogen
- b) Angiotensin I
- c) **Angiotensin II**
- d) Angiotensin-converting enzyme

025. Choose the group of antihypertensive drugs which diminishes the metabolism of bradykinin:

- a) Ganglioblockers
- b) Alfa-adrenoblockers
- c) Angiotensin-converting enzyme inhibitors**
- d) Diuretics

026. Hydralazine (a vasodilator) can produce:

- a) Seizures, extrapyramidal disturbances
- b) Tachycardia, lupus erythematosus**
- c) Acute hepatitis
- d) Aplastic anemia

027. Choose the vasodilator which releases NO:

- a) Nifedipine
- b) Hydralazine
- c) Minoxidil
- d) Sodium nitroprusside**

028. The reason of diuretics administration for hypertension treatment is:

- a) Block the adrenergic transmission
- b) Diminishing of blood volume and amount of Na<sup>+</sup> ions in the vessels endothelium**
- c) Depression of rennin-angiotensin-aldosterone system
- d) Depression of the vasomotor center

029. Tick the diuretic agent – aldosterone antagonist:

- a) Furosemide
- b) Spironolactone**
- c) Dichlothiazide
- d) Captopril

030. Tick the diuretic agent having a potent and rapid effect:

- a) Furosemide**
- b) Spironolactone
- c) Dichlothiazide
- d) Indapamide

**PART IX Hypertensive (anti-hypotensive) drugs. Drugs influencing cerebral blood flow. Anti-migraine agents**

001. The main principle of shock treatment is:

- a) To increase the arterial pressure
- b) To increase the peripheral vascular resistance
- c) To increase the cardiac output
- d) To improve the peripheral blood flow**

002. Pick out the drug which increases cardiac output:

- a) Noradrenalin**
- b) Methyldopa
- c) Phenylephrine
- d) Angiotensinamide

003. Tick the synthetic vasoconstrictor having an adrenomimetic effect:

- a) Noradrenalin
- b) Adrenalin
- c) Phenylephrine**
- d) Angiotensinamide

004. Indicate the vasoconstrictor of endogenous origin:

- a) Ephedrine
- b) Phenylephrine
- c) Xylomethazoline
- d) Angiotensinamide**

005. Which type of receptors can be activated by angiotensinamide:

- a) Adrenergic receptors
- b) Cholinergic receptors
- c) Dopaminergic receptors
- d) Angiotensin's receptors**

006. General unwanted effects of vasoconstrictors is:

- a) Increase of arterial pressure
- b) Increase of cardiac output
- c) Decrease of peripheral blood flow**
- d) Increase of blood volume

007. For increasing blood pressure in case of low cardiac output the following agents must be used:

- a) Ganglioblockers
- b) Vasoconstrictors
- c) Positive inotropic drugs**
- d) Diuretics

008. Tick the positive inotropic drug of glycoside structure:

- a) Dopamine
- b) Digoxin**
- c) Dobutamine
- d) Adrenalin

009. Tick the positive inotropic drug of non-glycoside structure:

- a) Digitoxin
- b) Digoxin
- c) Dobutamine**
- d) Strophanthin

010. Dopamine at low doses influences mainly:

- a) Alfa-adrenoreceptors (leads to peripheral vasoconstriction)
- b) Dopamine receptors (leads to vasodilation of renal and mesenteric vessels)**
- c) Beta-1 adrenoreceptors (leads to enhanced cardiac output)
- d) All of the above

011. Dopamine at medium doses influences mainly:

- a) Alfa-adrenoreceptors (leads to peripheral vasoconstriction)
- b) Dopamine receptors (leads to vasodilation of renal and mesenteric vessels)
- c) Beta-1 adrenoreceptors (leads to enhanced cardiac output)**
- d) All of the above

012. Dopamine in high doses influences mainly the:

- a) Alfa-adrenoreceptors (leads to peripheral vasoconstriction)**
- b) Dopamine's receptors (leads to vasodilation of renal and mesenteric vessels)
- c) Beta-1 adrenoreceptors (leads to enhancing of cardiac output)
- d) All of the above

013. Tick the group of drugs for treatment of shock with hypovolaemia (reduced circulating blood volume):

- a) Positive inotropic drugs
- b) Vasoconstrictors
- c) Plasmoexpanders**
- d) Analeptics and tonics

014. Tick the group of drugs for chronic hypotension treatment:

- a) Positive inotropic drugs
- b) Vasoconstrictors
- c) Plasmoexpanders
- d) Analeptics and tonics**

015. Indicate the group of drugs influencing the cerebral flow:

- a) Ca-channel blockers
- b) Derivatives of GABA
- c) Derivatives of Vinca minor plant
- d) All the above**

016. Tick the drug influencing the blood flow which is related to antiplatelet agents:

- a) Heparin
- b) Aspirin**
- c) Pyracetam
- d) Tanakan

017. Which of the following drugs is related to anticoagulants and may be useful in disorders of cerebral circulation?

- a) Aspirin
- b) Cinnarizine
- c) Nicergoline
- d) Heparin**

018. Indicate the drugs which are Ca-channel blockers influencing the brain blood flow:

- a) Aminalon, Picamilon
- b) Nimodipine, Cinnarizine**
- c) Heparin, Warfarin
- d) Vinpocetine, Nicergoline

019. Indicate the drugs influencing the blood flow in the brain - derivatives of GABA:

**a) Aminalon, Picamilon**  
 b) Nimodipine, Cinnarizine  
 c) Heparin, Warfarin  
 d) Vinpocetine, Nicergoline

020. Indicate the drug - Vinca minor alcaloid:  
 a) Nicergoline  
 b) Warfarin  
 c) Cinnarizine  
**d) Vinpocetine**

021. Tick the drug – a derivative of Ergot:  
**a) Nicergoline**  
 b) Warfarin  
 c) Cinnarizine  
 d) Vinpocetine

022. Indicate the nootropic agent useful in disorders of brain circulation:  
 a) Aspirin  
**b) Pyracetam**  
 c) Warfarin  
 d) All the above

023. What is the main action of GABA derivatives in disorders of brain circulation?  
 a) Decrease of vessel permeability  
**b) Stimulation of the metabolic processes in neurons**  
 c) Brain vessel constriction  
 d) Intracranial pressure increase

024. Choose the appropriate mechanism of vinpocetine action:  
**a) It dilates cerebral vessels and improves blood supply**  
 b) It constricts cerebral vessels and decreases blood supply  
 c) It stimulates GABA-receptors and thus increases cerebral metabolic processes  
 d) It constricts peripheral vessels and increases blood pressure

025. Antiaggregants are used in disorders of brain circulation for:  
 a) Stimulation of the metabolic processes in neurons  
 b) Dilation of cerebral vessels  
**c) Improving the microcirculation in cerebral tissue**  
 d) All the above

026. Migraine is a disorder connected with:  
 a) Thrombosis of cerebral vessels  
 b) Brain hemorrhage  
**c) Dysfunction of regulation of cerebral vessel tonus**  
 d) Malignant growth in brain

027. Main agents for acute migraine attack treatment are Ergot and indol derivatives and NSAID's. The consideration is:  
**a) True**  
 b) False

028. The following Indol derivative is used for treatment of acute migraine attack:  
 a) Paracetamol  
**b) Sumatriptan**  
 c) Ergotamine  
 d) Metoclopramide

029. The following Ergot derivative is used for treatment of acute migraine attack:  
 a) Paracetamol  
 b) Sumatriptan  
**c) Ergotamine**  
 d) Metoclopramide

030. The derivative of lysergic acid for migraine attack prevention is:  
 a) Metoclopramide  
**b) Methysergide**  
 c) Sumatriptan  
 d) Ergotamine

## (5) METABOLIC PROFILE DRUGS

**PART I Hypothalamic & Pituitary Hormones, Thyroid & Antithyroid Drugs****001.** Hormones are:

- a) Products of endocrine gland secretion**
- b) Mediators of inflammatory process
- c) By-products of tissue metabolism
- d) Product of exocrine gland secretion

**002.** Select an endocrine drug which is an amino acid derivative:

- a) Insulin
- b) Hydrocortisone
- c) Calcitonin
- d) Thyroxine**

**003.** Select an endocrine drug which is a peptide derivative:

- a) Oxitocin**
- b) Prednisolone
- c) Nandrolone
- d) Progesterone

**004.** Select an endocrine drug which is a steroidal derivative:

- a) Gonadorelin
- b) Insulin
- c) Levothyroxine
- d) Hydrocortisone**

**005.** Hormone analogues are:

- a) Naturally occurring substances but slightly different from hormones
- b) Naturally occurring substances but less efficacious than hormones
- c) Naturally occurring substances having the same structure but different pharmacological properties than hormones
- d) Synthetic compounds, which resemble the naturally occurring hormones**

**006.** Regarding the mechanism of action of hormones, indicate the FALSE statement:

- a) Hormones interact with the specific receptors in the wall of the cells**
- b) Cyclic AMP acts as a second messenger system
- c) They stimulate adenylyl cyclase enzyme
- d) Many hormones owe their effect to primary actions on subcellular membrane.

**007.** Hypothalamic and pituitary hormones (and their synthetic analogs) have pharmacologic applications in three areas, EXCEPT the following:

- a) As replacement therapy for hormone deficiency states
- b) As drug therapy for a variety of disorders using pharmacologic doses to elicit a hormonal effect that is not present at physiologic blood levels
- c) As a diagnostic tool for performing stimulation tests to diagnose hypo- or hyperfunctional endocrine states
- d) As food supplements**

**008.** Which of the following hormones is produced by the hypothalamic gland?

- a) Growth hormone-releasing hormone (GHRH)**
- b) Follicle-stimulating hormone (FSH)
- c) Aldosterone
- d) Estradiol

**009.** Which of the following hormones is produced by the anterior lobe of the pituitary?

- a) Thyrotropin-releasing hormone (TRH)
- b) Corticotropin-releasing hormone (CRH)
- c) Growth hormone (somatotropin, GH)**
- d) Growth hormone-releasing hormone (GHRH)

**010.** The posterior pituitary does NOT secret:

- a) Vasopressin
- b) Oxytocin
- c) Growth hormone**
- d) All of the above

**011.** Which of the following organs is a target for prolactin?

- a) Liver
- b) Adrenal cortex
- c) Thyroid
- d) Mammary gland**

012. Which of the following organ hormones is a target for growth hormone (somatotropine, GH)?  
 a) Glucocorticoids  
**b) Insulin-like growth factors (IGF, somatomedins)**  
 c) Triiodothyronine  
 d) Testosterone

013. All of the following statements about growth hormone are true, EXCEPT:  
 a) It may stimulate the synthesis or release of somatomedins  
 b) Low levels of insulin-like growth factor (IGF)-1 are associated with dwarfism  
**c) Hypersecretion can result in acromegaly**  
 d) It is contraindicated in subjects with closed epiphyses

014. Correct statements about adrenocorticotrophic hormone (ACTH) include all of the following, EXCEPT:  
 a) Endogenous ACTH is also called corticotropin  
 b) ACTH stimulates the synthesis of corticosteroids  
 c) ACTH is most useful clinically as a diagnostic tool in adrenal insufficiency  
**d) The oral route is the preferred route of administration**

015. The hypothalamic control exists for the thyroid gland. This consideration is:  
**a) True**  
 b) False.

016. Indications of bromocriptine are following, EXCEPT:  
 a) Prolactin-secreting adenomas  
 b) Amenorrhea-Galactorrhea  
**c) Prolactin deficiency**  
 d) Acromegaly

017. Currently used dopamine agonists decreasing pituitary prolactin secretion are following:  
 a) Bromocriptine  
 b) Cabergoline  
 c) Pergolide  
**d) All of the above**

018. Indications of oxytocin are following:  
 a) Labor and augment dysfunctional labor for conditions requiring early vaginal delivery  
 b) Incompleted abortion  
 c) For control of postpartum uterine hemorrhage  
**d) All of the above**

019. Indications of vasopressin are following:  
 a) Diabetes mellitus  
 b) Hypertension  
**c) Pituitary diabetes insipidus**  
 d) Incompleted abortion

020. Vasopressin possesses the following:  
**a) Antidiuretic property**  
 b) Vasodilatation property  
 c) Release of a thyroid hormone into the plasma  
 d) Diuretic property

021. Oxytocin produces the following effects:  
 a) It causes contraction of the uterus  
 b) It assists the progress of spermatozoa into the uterine cavity  
 c) It brings about milk ejection from the lactating mammary gland  
**d) All of the above**

022. Vasopressin causes a pressor effect by:  
 a) Releasing noradrenaline from the nerve terminals  
 b) Releasing and activating renin-angiotensin system  
**c) A direct action on smooth muscles of the blood vessels**  
 d) All of the above mechanisms

023. Which of the following statements is true  
**a) Hypothyroidism is a syndrome resulting from deficiency of thyroid hormones and is manifested largely by a reversible slowing down of all body functions**  
 b) Hypothyroidism is the clinical syndrome that results when tissues are exposed to high levels of thyroid hormone

024. Which of the following hormones is produced by the thyroid gland?  
**a) Thyroxine**  
 b) Thyroid-stimulating hormone  
 c) Thyrotropin-releasing hormone

d) Thyroglobulin.

025. Which of the following hormones is produced by the thyroid gland?

- Thyroid-stimulating hormone
- Thyrotropin-releasing hormone
- Triiodothyronine**
- Thyroglobulin.

026. Thyroid stimulating hormone regulates the following:

- Iodine uptake
- Biosynthesis of iodothyroglobulin
- Release of thyroid hormone into the plasma
- All of the above.**

027. Thyroid hormones produce various pharmacological effects. Indicate the wrong statement(s).

- Decline of the basal metabolic rate in the body**
- Increase in the rate and force of contraction of the heart
- Increase in the blood cholesterol level
- Increase in the heat production

028. Synthesis and release of thyroid hormones are controlled by:

- Anterior pituitary alone
- Hypothalamus alone
- Blood levels of thyroid hormones alone
- All of the above**

029. Thyrotrophin stimulates the following processes:

- Concentration of iodine by thyroid follicles
- Iodination of thyroglobulin
- Release of thyroxine and triiodothyronine**
- De-iodination of thyroid hormones.

030. The rate of secretion of thyrotropin is controlled by:

- The amount of iodine in the thyroid gland
- The amount of thyroid hormones in the thyroid gland
- The concentration of thyroid hormones in blood**
- The concentration of catecholamines in blood

031. Indications of thyroid hormones are following, EXCEPT:

- Cretinism
- Myxoedema
- Hashimoto's disease
- For treatment of simple obesity**

032. The common side effect of thyroid hormones is following:

- Increases in basal metabolic rate
- Angina pectoris
- Tremors
- Exophthalmos**

033. Currently used antithyroid drugs include the following, EXCEPT:

- Propylthiouracil (PTU)
- Diatrizoate sodium (Hypaque)
- Methimazole (Tapazole)
- Potassium perchlorate**

034. In an area where goitre is endemic, which of the following drugs is used?

- Iodide 1 part in 100000**
- Propylthiouracil 200 mg daily
- Methimazole 40 mg daily
- Any of the above can be used.

035. Iodide preparations can be used in following situations, EXCEPT:

- In thyroid disorders
- In granulomatous lesions e.g. Syphilis
- As an antiseptic
- In iodism**

036. Daily administration of large doses (several milligrammes) of iodides to a thyrotoxic patient causes:

- Involution of the thyroid which reaches a maximum in two weeks
- Increased vascularity of the thyroid gland
- Decreased storage of the colloid in the thyroid gland
- Thyroid gland growing firm and less vascular**

037. Radioiodines (I131 and I132) is suitable for:

- a) **Elderly patients (over 45 years)**
- b) Pregnant women
- c) Nursing mothers
- d) Younger patients

038. Radioiodines in the body emit:

- a) **Mainly  $\beta$  radiations**
- b) Mainly  $\gamma$  radiations
- c)  $\beta$  and  $\gamma$  radiations equally.
- d) Do not emit any radiation, therefore, are safe

#### **PART II Pancreatic Hormones & Antidiabetic Drugs**

001. Secretory products of pancreatic  $\beta$ -cells are:

- a) Glucagon, proglucagon
- b) Insulin, C-peptide, proinsulin, islet amyloid polypeptide (IAPP)**
- c) Somatostatin
- d) Pancreatic polypeptide (PP)

002. Insulin is:

- a) A glycoprotein with a molecular weight of 6000
- b) A small protein with a molecular weight of 5808 having disulphide linkage**
- c) A fructooligosaccharide
- d) A catecholamine

003. Insulin is a polypeptide hence:

- a) It is resistant to destruction by gastric juice
- b) It is destroyed by gastric juice**
- c) It is not a polypeptide
- d) It is metabolized immediately by cellular enzymes

004. Bovine insulin is less antigenic than porcine. This consideration is:

- a) True
- b) False**

005. Insulin causes reduction in blood sugar level by the following mechanisms, EXCEPT:

- a) Increased glucose uptake in the peripheral tissue
- b) Reduction of breakdown of glycogen
- c) Diminished gluconeogenesis
- d) Decreased glucose absorption from the gut**

006. Which of the following is true for glucagon?

- a) Stimulates gluconeogenesis in the liver**
- b) Stimulates the secretion of insulin by beta cells
- c) Inhibits glucose utilization by skeletal muscle
- d) Inhibits uptake of aminoacids by cells.

007. Insulin can not be administered by:

- a) Oral route**
- b) Intravenous route
- c) Subcutaneous route
- d) Intramuscular route.

008. Sources of human insulin production are:

- a) Recombinant DNA techniques by inserting the proinsulin gene into *E. coli* or yeast**
- b) Postmortem insulin extraction from human autopsy pancreas
- c) All of the above
- d) None of the above

009. The primary reason for a physician to prescribe human insulin is that:

- a) It has a faster onset of action than other insulins
- b) It has a shorter duration of action than other insulins
- c) It can be given to patients who have an allergy to animal insulins**
- d) It is more effective in preventing the complications of diabetes than animal insulins

010. Correct statements about crystalline zinc (regular) insulin include all of the following, EXCEPT:

- a) It can serve as replacement therapy for juvenile-onset diabetes
- b) It can be administered intravenously
- c) It is a short-acting insulin
- d) It can be administered orally**

011. Diabetic coma is treated by the administration of:

- a) Lente insulin
- b) Glucose
- c) **Crystalline insulin**
- d) Oral anti-diabetic drugs.

012. Sulphonylureas act by:

- a) Reducing the absorption of carbohydrate from the gut
- b) Increasing the uptake of glucose in peripheral tissues
- c) Reducing the hepatic gluconeogenesis
- d) **Stimulating the beta islet cells of pancreas to produce insulin**

013. Sulphonylureas are effective in totally insulin deficient patients. This consideration is:

- a) True
- b) **False**

014. Currently used second-generation sulfonylureas include the following, EXCEPT:

- a) Glyburide (Glibenclamide)
- b) Glipizide (Glydiazinamide)
- c) Glimepiride (Amaril)
- d) **Tolbutamide (Orinase)**

015. Currently used oral hypoglycemic thiazolidinediones include the following, EXCEPT

- a) Pioglitazone (Actos)
- b) Rosiglitazone (Avandia)
- c) **Troglitazone (Rezulin)**
- d) All of the above

016. Thiazolidinediones act by:

- a) **Diminishing insulin resistance by increasing glucose uptake and metabolism in muscle and adipose tissues**
- b) Reducing the absorption of carbohydrate from the gut
- c) Stimulating the beta islet cells of pancreas to produce insulin
- d) All of the above

017. Currently used alpha-glucosidase inhibitors include the following, EXCEPT:

- a) **Pioglitazone (Actos)**
- b) Acarbose (Precose)
- c) Miglitol (Glyset)
- d) All of the above

018. Alpha-glucosidase inhibitors act by:

- a) Diminishing insulin resistance by increasing glucose uptake and metabolism in muscle and adipose tissues
- b) **Competitive inhibiting of intestinal alpha-glucosidases and modulating the postprandial digestion and absorption of starch and disaccharides**
- c) Reducing the absorption of carbohydrate from the gut
- d) Stimulating the beta islet cells of pancreas to produce insulin

019. Potency of action of

- a) **Miglitol is six times higher than that of acarbose**
- b) Acarbose is more than that of miglitol
- c) Miglitol and acarbose is equal
- d) Oral hypoglycemic agents depend on the severity of hyperglycemia

020. Which of the following oral hypoglycaemic drugs stimulates both synthesis and release of insulin from beta islet cells:

- a) **Glibenclamide**
- b) Phenformin
- c) Buformine
- d) Metformin

021. Currently used oral hypoglycemic biguanides include the following, EXCEPT:

- a) Repaglinide (Prandin)
- b) Metformin
- c) Phenformine
- d) **Glipizide**

022. The action of insulin is potentiated by:

- a) Sulphonylureas
- b) Glucagon
- c) **Biguanides**
- d) None of the above

023. Duration of action of:

- a) Tolbutamide is more than that of chlorpropamide

**b) Chlorpropamide is more than that of tolbutamide**  
 c) Tolbutamide and chlorpropamide is equal  
 d) Oral hypoglycemic agents depend on the severity of hyperglycemia

024. Side effects of sulphonylureas are less than those of biguanides. This considerations is:  
 a) **True**  
 b) False

025. Biguanides are used in the following conditions, EXCEPT:  
 a) As a supplement to sulphonylurea, where it is insufficient to give good results  
 b) In over weight diabetics  
 c) To reduce insulin requirements  
**d) In case of hyperglycemic shock**

026. Which of the following agents is/are important hormonal antagonists of insulin in the body?  
 a) Glucagon  
 b) Adrenal steroids  
 c) Adrenaline  
**d) All of the above**

027. Glucagon is:  
 a) A glycoprotein with a molecular weight of 6000  
**b) A peptide – identical in all mammals – consisting of a single chain of 29 amino acids**  
 c) A fructooligosaccharide  
 d) A small protein with a molecular weight of 5808 having disulphide linkage

028. Which of the following statements is FALSE?  
 a) Glucagon is synthesized in the A cells of the pancreatic islets of Langerhans.  
 b) Glucagon is a peptide – identical in all mammals – consisting of a single chain of 29 amino acids  
 c) Glucagon is extensively degraded in the liver and kidney as well as in plasma, and at its tissue receptor sites.  
**d) Half-life of glucagon is between 6 and 8 hours, which is similar to that of insulin**

029. Glucagon can be used in the following situations, EXCEPT:  
 a) Severe hypoglycemia  
**b) Severe hyperglycemia**  
 c) Endocrine diagnosis  
 d) Beta-blocker poisoning

030. Main complications of insulin therapy include the following:  
 a) Hypoglycemia  
 b) Insulin allergy  
 c) Lipodystrophy at an injection site  
**d) All of the above**

**PART III The Gonadal Hormones & Inhibitors**

001. The major natural estrogens produced by women are following, EXCEPT:  
 a) Estradiol (Estradiol-17 $\beta$ , E<sub>2</sub>)  
 b) Estron (E<sub>1</sub>)  
**c) Ethynodiol diacetate**  
 d) Estriol (E<sub>3</sub>)

002. Which of the following statements about estrogens are True:  
 a) Estrogens are required for normal sexual maturation and growth of the female  
 b) Estrogens decrease the rate of resorption of bone  
 c) Estrogens enhance the coagulability of blood  
**d) All of the above**

003. The major synthetic estrogens are following, EXCEPT:  
 a) Dienestrol  
 b) Diethylstilbestrol  
 c) Benzestrol  
**d) Estradiol**

004. Which of the following statements about estrogens are True:  
 a) Estradiol binds strongly to an  $\alpha_2$ -globulin and albumin with lower affinity  
 b) Estradiol is converted by liver and other tissues to estron and estriol and their 2-hydroxylated derivatives and conjugated metabolites and excreted in the bile  
 c) Estrone and estriol have lower affinity for the estrogen receptors than estradiol  
**d) All of the above**

005. Indications of synthetic estrogens are following, EXCEPT:

- a) Primary hypogonadism
- b) Postmenopausal hormonal therapy
- c) Hormonal contraception
- d) For treatment of simple obesity**

**006.** Main complications of estrogens' therapy include the following:

- a) Postmenopausal uterine bleeding
- b) Breast tenderness
- c) Hyperpigmentation
- d) All of the above**

**007.** Main contraindications of estrogens' therapy include the following:

- a) Estrogen-dependent neoplasmas such as carcinoma of the endometrium or carcinoma of the breast
- b) Undiagnosed genital bleeding
- c) Liver disease
- d) All of the above**

**008.** Tamoxifen is:

- a) Antiprogestin
- b) Antiandrogen
- c) Antiestrogen**
- d) Androgen

**009.** Progesterone is secreted by:

- a) Ovarian follicles
- b) Corpus luteum**
- c) Granulosa and theca cells
- d) All of the above

**010.** The major natural progestin is:

- a) Estradiol
- b) Estron
- c) Progesterone**
- d) Estriol

**011.** Which of the following statements about progestins is True:

- a) Progesterone is rapidly absorbed following administration by any route
- b) In the liver, progesterone is metabolized to pregnanediol and conjugated with glucuronic acid.
- c) Significant amounts of progestins and their metabolites are excreted in the urine
- d) All of the above**

**012.** The normal ovary produces small amount of androgens, including testosterone, androstenedione, and dehydroepiandrosterone. This consideration is:

- a) True**
- b) False

**013.** Noncontraceptive clinical uses of progestins are following:

- a) Hormone replacement therapy
- b) Dysmenorrhea
- c) Endometriosis
- d) All of the above**

**014.** Estrogens possess immunomodulator properties, but progestins do immunodepressant ones. Is it TRUE or FALSE?

- a) True**
- b) False

**015.** Mifepristone (RU-486) is:

- a) Antiprogestin**
- b) Antiandrogen
- c) Antiestrogen
- d) Androgen

**016.** Mifepristone (RU-486) is used as a contraceptive and abortifacient. This consideration is:

- a) True**
- b) False

**017.** Actions of mifepristone (RU-486) include:

- a) Inhibition of ovulation during the follicular phase by blocking hypothalamic-pituitary progesterone receptors, which suppresses midcycle gonadotropin release
- b) During the luteal phase, inhibition of progesterone action on the uterus, which induces prostaglandin release from the endometrium
- c) Termination of pregnancy by facilitating luteolysis, menstruation, uterine motility, softening of the cervix, and detachment of the embryo.

**d) All of the above****018.** All of the following statements about oral contraceptives are true, EXCEPT:

- a) The "combination pill" contains both estrogen and progestin
- b) Ethinyl estradiol and mestranol are commonly used in oral contraceptives
- c) The "minipill" contains progestin alone
- d) The "triphasic pill" contains estrogen, progestin, and luteinizing hormone (LH)**

**PART IV Glucocorticoid, Steroidal & Nonsteroidal Anti-Inflammatory Drugs****001.** Glucocorticoids are hormonal steroids:

- a) Having an important effect on intermediary metabolism, cardiovascular function, growth, and immunity**
- b) Having principally salt-retaining activity
- c) Having androgenic or estrogenic activity
- d) All of the above

**002.** Inflammation is:

- a) A localized protective reaction of a tissue to irritation, injury, or infection, characterized by pain, redness, swelling, and sometimes loss of function**
- b) A deficiency of the normal immune response.
- c) A reaction resulting from an immune reaction produced by an individual's white blood cells or antibodies acting on the body's own tissues or extracellular proteins.
- d) All of the above

**003.** An acute, transient phase, of inflammation is characterized by:

- a) Local vasodilatation and increased capillary permeability (phase of damage)**
- b) Infiltration of leucocytes and phagocytic cells (phase of exudation)
- c) Tissue degeneration and fibrosis occurrence (phase of proliferation)
- d) All of the above

**004.** A delayed, subacute phase, of inflammation is characterized by:

- a) Local vasodilatation and increased capillary permeability (phase of damage)
- b) Infiltration of leucocytes and phagocytic cells (phase of exudation)**
- c) Tissue degeneration and fibrosis occurrence (phase of proliferation)
- d) All of the above

**005.** A chronic, proliferative phase, of inflammation is characterized by:

- a) Local vasodilatation and increased capillary permeability (phase of damage)
- b) Infiltration of leucocytes and phagocytic cells (phase of exudation)
- c) Tissue degeneration and fibrosis occurrence (phase of proliferation)**
- d) All of the above

**006.** The following substances are considered to be referred to as eicosanoids:

- a) Prostaglandins
- b) Leukotrienes
- c) Thromboxanes
- d) All of the above**

**007.** Correct statements about cortisol (hydrocortisone) include all of the following, EXCEPT:

- a) Cortisol is synthesized from cholesterol
- b) ACTH governs cortisol secretion
- c) Most cortisol is inactivated in the liver
- d) The half-life of cortisol in the circulations is normally about 60-90 hours.**

**008.** Correct statements about glucocorticoids include all of the following, EXCEPT:

- a) Effects of glucocorticoids are mediated by widely distributed glucocorticoid receptors that are members of the superfamily of nuclear receptors.
- b) Glucocorticoids have dose-related metabolic effects on carbohydrate, protein, and fat metabolism.
- c) Glucocorticoids have pro-inflammatory effects.**
- d) Glucocorticoids have catabolic effects in lymphoid and connective tissue, muscle, fat, and skin.

**009.** Physiologic doses of glucocorticoid can result in:

- a) Increased liver glycogen stores, gluconeogenesis and lipolysis
- b) Maintenance of cardiovascular function (by potentiation of norepinephrine) and skeletal muscle function
- c) Increased hemoglobin synthesis, resulting in elevated of red blood cell count
- d) All of the above**

**010.** Which of the following glucocorticoids is a short- to medium-acting drug?

- a) Prednisolon**
- b) Dexamethasone
- c) Triamcinolone
- d) All of the above

**011.** Which of the following glucocorticoids is an intermediate-acting drug?

- Cortisone
- Triamcinolone**
- Butamethasone
- All of the above

**012.** Which of the following glucocorticoids is a long-acting drug?

- Prednisolon
- Dexamethasone**
- Triamcinolone
- All of the above

**013.** Which of the following glucocorticoids have one fluoride atom in its chemical structure?

- Prednisolon
- Fluocinolone
- Triamcinolone**
- All of the above

**014.** Which of the following glucocorticoids have two fluoride atoms in its chemical structure?

- Prednisolon
- Dexamethasone
- Fluocinolone**
- Triamcinolone

**015.** Which of the following glucocorticoids has no fluoride atoms in its chemical structure?

- Prednisolon**
- Dexamethasone
- Fluocinolone
- Triamcinolone

**016.** Anti-inflammatory effect of glucocorticoids is caused by

- Reducing the prostaglandin and leukotriene which results from inhibition of phospholipase A<sub>2</sub>
- Reducing macrophages migration into the site of inflammation
- Decreasing capillary permeability
- All of the above**

**017.** Which of the following statements concerning the anti-inflammatory effect of glucocorticoids is TRUE?

- Anti-inflammatory effect of glucocorticoids results from inhibition of cyclooxygenase
- Anti-inflammatory effect of glucocorticoids results from inhibition of phospholipase A<sub>2</sub> and reducing prostaglandin and leukotriene synthesis**
- Induction of cyclooxygenase II expression which results in reducing amount of an enzyme available to produce prostoglandins
- All of the above

**018.** Immunosuppressive effect of glucocorticoids is caused by:

- Reducing concentration of lymphocytes (T and B cells) and inhibiting function of tissue macrophages and other antigen-presenting cells**
- Suppression of cyclooxygenase II expression which results in reducing amount of an enzyme available to produce prostoglandins
- Activation of phospholipase A<sub>2</sub> and reducing prostaglandin and leukotriene synthesis.
- All of the above

**019.** Which of the following statements concerning the anti-inflammatory effect of NSAIDs are TRUE?

- Anti-inflammatory effect of NSAIDs results from inhibition of cyclooxygenase**
- Anti-inflammatory effect of NSAIDs results from inhibition of phospholipase A<sub>2</sub> and reducing prostaglandin and leukotriene synthesis
- Anti-inflammatory effect of NSAIDs results from induction of cyclooxygenase II expression which results in reducing the amount of an enzyme available to produce prostoglandins
- All of the above

**020.** Indication of glucocorticoids is:

- Chronic (Addison's disease) and acute adrenocortical insufficiency
- Organ transplants (prevention and treatment of rejection – immunosuppression)
- Inflammatory conditions of bones and joints (arthritis, bursitis, tenosynovitis).
- All of the above**

**021.** Indications of glucocorticoids are following, EXCEPT:

- Gastrointestinal diseases (inflammatory bowel disease)
- Postmenopausal hormonal therapy**
- Inflammatory conditions of bones and joints (arthritis, bursitis, tenosynovitis)
- Skin diseases (atopic dermatitis, dermatoses, localized neurodermatitis)

022. Serious side effects of glucocorticoids include the following, EXCEPT:

- Acute peptic ulcers
- Iatrogenic Cushing's syndrome (rounding, puffiness, fat deposition and plethora alter the appearance of the face – moon faces)
- Salicylism (vomiting, tinnitus, decreased hearing, and vertigo)**
- Hypomania or acute psychosis

023. Serious side effects of glucocorticoids include the following:

- Adrenal suppression
- Insomnia, behavioral changes (primarily hypomania)
- Rounding, puffiness, fat deposition and plethora alter the appearance of the face – moon faces
- All of the above**

024. Selective COX-2 inhibitors are safer than nonselective COX-1 inhibitors but without loss of efficacy. This consideration is:

- True**
- False

025. The constitutive COX-2 isoform tends to be homeostatic in function, while COX-1 is induced during inflammation and tends to facilitate the inflammatory response. The consideration is:

- True
- False**

026. Which of the following property combinations is peculiar to the majority of NSAIDs?

- Antihistaminic, antipyretic, analgesic
- Immunodepressive, anti-inflammatory, analgesic
- Antipyretic, analgesic, anti-inflammatory**
- Anti-inflammatory, immunodepressive, antihistaminic

027. Which of the following NSAIDs is a propionic acid derivative?

- Ibuprofen**
- Indomethacin
- Metamizole (Analgin)
- Diclofenac

028. Which of the following NSAIDs is an indol derivative?

- Ibuprofen
- Indomethacin**
- Meclofenamic acid
- Diclofenac

029. Which of the following NSAIDs is a pyrazolone derivative?

- Ibuprofen
- Indomethacin
- Metamizole (Analgin)**
- Diclofenac

030. Which of the following NSAIDs is a fenamate derivative?

- Phenylbutazone
- Indomethacin
- Meclofenamic acid**
- Diclofenac

031. Which of the following NSAIDs is an oxicam derivative?

- Piroxicam**
- Indomethacin
- Meclofenamic acid
- Diclofenac

032. Which of the following NSAIDs is a selective COX-2 inhibitor?

- Piroxicam
- Indomethacin
- Celecoxib**
- Diclofenac

033. Which of the following NSAIDs is a nonselective COX inhibitor

- Piroxicam**
- Rofecoxib
- Celecoxib
- All of the above

034. The following statements concerning aspirin are true, EXCEPT:

- In contrast to most other NSAIDs, aspirin irreversibly inhibits COX
- Aspirin interferes with the chemical mediators of the kallikrein system

c) Aspirin inhibits phospholipase A<sub>2</sub>  
 d) Aspirin inhibits tromboxane A<sub>2</sub> formation

035. Indication for aspirin administration are the following, EXCEPT:  
 a) Inflammatory conditions  
 b) Decreasing the incidence of transient ischemic attack, unstable angina, coronary artery thrombosis with myocardial infarction, and thrombosis after coronary artery bypass grafting  
**c) Relieving severe visceral pain, e.g. myocardial infarction, cancer pain condition, renal or biliary colic**  
 d) Reducing elevated body temperature

036. Side effects of aspirin include following:  
 a) Gastric upset (intolerance)  
 b) Salicylism (vomiting, tinnitus, decreased hearing, and vertigo)  
 c) Gastric ulcers and upper gastrointestinal bleeding  
**d) All of the above**

037. Serious side effects of metamizole (analgin) include the following:  
**a) Agranulocytosis, aplastic anemia**  
 b) Salicylism (vomiting, tinnitus, decreased hearing, and vertigo)  
 c) Iatrogenic Cushing's syndrome (rounding, puffiness, fat deposition and plethora alter the appearance of the face – moon faces)  
 d) All of the above

038. Side effects of indometacin include the following:  
 a) Abdominal pain, diarrhea, gastrointestinal hemorrhage and pancreatitis  
 b) Dizziness, confusion and depression  
 c) Trombocytopenia  
**d) All of the above**

039. Ketoprofen is a propionic acid derivative that inhibits both cyclooxygenase (nonselectively) and lipoxygenase. This statement is:  
**a) True**  
 b) False

040. Ketorolac is an NSAID that is promoted for systemic use as an anti-inflammatory, not as an analgesic drug. This statement is:  
 a) True  
**b) False**

041. Which of the following drugs is a 5-lipoxygenase (5-LOG) inhibitor?  
 a) Ibuprofen  
**b) Zileuton (Zyflo)**  
 c) Metamizole (Analgin)  
 d) Diclofenac

042. Which of the following drugs is a leucotriene D4 receptor (LTD4) blocker?  
 a) Ibuprofen  
 b) Zileuton (Zyflo)  
**c) Zafirlukast (Accolate)**  
 d) Diclofenac

043. Which of the following drugs is a thromboxane A2 receptor (TXA2) antagonist?  
**a) Sulotroban**  
 b) Zileuton (Zyflo)  
 c) Zafirlukast (Accolate)  
 d) Diclofenac

#### **PART V Immunotropic & Antiallergic Agents**

001. Immune system is the integrated body system of organs, tissues, cells, and cell products that differentiates self from nonself and neutralizes potentially pathogenic organisms or substances. This consideration is:  
**a) True**  
 b) False

002. Antigen is any of various substances, including toxins, bacteria, and the cells of transplanted organs, that when introduced into the body stimulate the production of antibodies. It is also called an allergen or immunogen. This consideration is:  
**a) True**  
 b) False

003. Antibody is a protein substance produced in the blood or tissues in response to a specific antigen, such as a bacterium or a toxin that destroys or weakens bacteria and neutralizes organic poisons, thus forming the basis of immunity. This consideration is:

- True
- False

004. Innate immunity refers to:

- Antigen-nonspecific defense mechanisms that a host uses immediately or within several hours after exposure to an antigen. This is the immunity one is born with and is the initial response by the body to eliminate microbes and prevent infection**
- Antigen-specific defense mechanisms that take several days to become protective and are designed to react with and remove a specific antigen. This is the immunity one develops throughout life

005. Adaptive (acquired) immunity refers to:

- Antigen-nonspecific defense mechanisms that a host uses immediately or within several hours after exposure to an antigen. This is the immunity one is born with and is the initial response by the body to eliminate microbes and prevent infection
- Antigen-specific defense mechanisms that take several days to become protective and are designed to react with and remove a specific antigen. This is the immunity one develops throughout life**

006. Allergic reaction is:

- A local or generalized reaction of an organism to internal or external contact with a specific allergen to which the organism has been previously sensitized**
- A localized protective reaction of tissue to irritation, injury, or infection, characterized by pain, redness, swelling, and sometimes a loss of function

007. Immediate allergy reaction (type I allergic reaction) is:

- An allergic or immune response that begins within a period lasting from a few minutes to about an hour after exposure to an antigen to which the individual has been sensitized**
- An allergic reaction that becomes apparent only hours after contact
- An allergic reaction that results from the formation of antigen-antibody complexes between a foreign antigen and IgM or IgG immunoglobulins. (It occurs during blood transfusion reactions and in hemolytic disease of the newborn)
- An allergic reaction that is due to the presence of elevated levels of antigen-antibody complexes that cause tissue damage

008. Delayed allergy reaction (type IV allergic reaction) is:

- An allergic or immune response that begins within a period lasting from a few minutes to about an hour after exposure to an antigen to which the individual has been sensitized
- An allergic reaction that becomes apparent only hours after contact**
- An allergic reaction that results from the formation of antigen-antibody complexes between a foreign antigen and IgM or IgG immunoglobulins. (It occurs during blood transfusion reactions and in hemolytic disease of the newborn)
- An allergic reaction that is due to the presence of elevated levels of antigen-antibody complexes that cause tissue damage

009. Immunodeficiency:

- A localized protective reaction of tissue to irritation, injury, or infection, characterized by pain, redness, swelling, and sometimes a loss of function
- A disorder or deficiency of the normal immune response**
- A disease resulting from an immune reaction produced by an individual's white blood cells or antibodies acting on the body's own tissues or extracellular proteins
- All of the above

010. Anaphylactic shock is a severe, sometimes fatal allergic reaction characterized by a sharp drop in blood pressure, urticaria, and breathing difficulties that is caused by exposure to a foreign substance, such as a drug or bee venom, after preliminary or sensitizing exposure. This consideration is:

- True
- False

011. H1 histamine receptor subtype is distributed in:

- Smooth muscle, endothelium and brain**
- Gastric mucosa, cardiac muscle, mast cells and brain
- Presynaptically in brain, mesenteric plexus and other neurons
- All of the above

012. H2 histamine receptor subtype is distributed in:

- Smooth muscle, endothelium and brain
- Gastric mucosa, cardiac muscle, mast cells and brain**
- Presynaptically in brain, mesenteric plexus and other neurons
- All of the above

013. Most tissue histamine is sequestered and bound in:

- a) Granules in mast cells or basophils
- b) Cell bodies of histaminergic neurons
- c) Enterochromaffin-like cell of the fundus of the stomach
- d) All of the above**

014. These categories of histamine H<sub>1</sub> antagonists are noted for sedative effects, EXCEPT:

- a) Piperidines; i.e. Loratadine, Fexofenadine**
- b) Ethanolamines (aminoalkyl ethers); i.e. Dimedrol, Clistin
- c) Ethylenediamines; i.e. Suprastine
- d) Phenothiazines; i.e. Diprazine, Promethazine

015. Which category of histamine H<sub>1</sub> antagonists is noted for the best antiemetic action?

- a) Alkylamines (propylamines); i.e. Brompheniramine
- b) Ethanolamines (aminoalkyl ethers); i.e. Doxylamine**
- c) Piperazines; i.e. Hydroxyzine, Cyclizine
- d) Ethylenediamines; i.e. Suprastine

016. These categories of histamine H<sub>1</sub> antagonists are noted for the anticholinergic effect, EXCEPT:

- a) Alkylamines (propylamines); i.e. Brompheniramine
- b) Piperazines; i.e. Hydroxyzine, Cyclizine**
- c) Ethylenediamines; i.e. Suprastine
- d) Phenothiazines; i.e. Diprazine, Promethazine

017. Which category of histamine H<sub>1</sub> antagonists is noted for the alpha-adrenoreceptor-blocking effect?

- a) Alkylamines (propylamines); i.e. Brompheniramine
- b) Ethanolamines (aminoalkyl ethers); i.e. Doxylamine, Dimedrol
- c) Ethylenediamines; i.e. Suprastine
- d) Phenothiazines; i.e. Diprazine, Promethazine**

018. Which category of histamine H<sub>1</sub> antagonists is noted for the highest local anesthetic effect?

- a) Alkylamines (propylamines); i.e. Brompheniramine
- b) Piperidines; i.e. Loratadine, Fexofenadine
- c) Ethylenediamines; i.e. Suprastine
- d) Phenothiazines; i.e. Promethazine**

019. Which category of histamine H<sub>1</sub> antagonists is recognized for as second-generation antihistamines?

- a) Alkylamines (propylamines); i.e. Brompheniramine
- b) Piperidines; i.e. Loratadine, Fexofenadine**
- c) Ethylenediamines; i.e. Suprastine
- d) Phenothiazines; i.e. Promethazine

020. These histamine H<sub>1</sub> antagonists are recognized for as second-generation antihistamines, EXCEPT:

- a) Astemizole
- b) Loratadine (Claritin)
- c) Cetirizine (Zyrtec)
- d) Suprastine**

021. Which of histamine H<sub>1</sub> antagonists is noted for the serotonin-blocking effect?

- a) Brompheniramine
- b) Cyproheptadine**
- c) Suprastine
- d) Dimedrol

022. Which of the following histamine H<sub>1</sub> antagonists is a long-acting (up to 24-48 h) antihistamine drug?

- a) Diazoline**
- b) Diprazine
- c) Suprastine
- d) Dimedrol

023. Which of histamine H<sub>1</sub> antagonists is noted for the ulcerogenic effect?

- a) Diazoline**
- b) Loratadine
- c) Suprastine
- d) Dimedrol

024. Indication for administration of histamine H<sub>1</sub> antagonists is:

- a) Prevention or treatment of the symptoms of allergic reactions (rhinitis, urticaria)
- b) Motion sickness and vestibular disturbances
- c) Nausea and vomiting in pregnancy ("morning sickness")
- d) All of the above**

025. Indications for administration of histamine H<sub>1</sub> antagonists are the following EXCEPT:

- a) Prevention or treatment of the symptoms of allergic reactions (rhinitis, urticaria)

**b) Management of seizure states**

- c) Nausea and vomiting in pregnancy ("morning sickness")
- d) Treatment of sleep disorders

026. Side effect of first-generation histamine H<sub>1</sub> antagonists is:

- a) Aplastic anemia
- b) Vomiting, tinnitus, decreased hearing
- c) Sedation**
- d) Gastric ulcers and upper gastrointestinal bleeding

027. For those first-generation histamine H<sub>1</sub> antagonists that cause significant sedation, addition of other drugs that cause central nervous system depression produces additive effects and is contraindicated while driving or operating machinery. This consideration is:

- a) True**
- b) False

028. Immunosuppressive drug is any of a variety of substances used to prevent production of antibodies, protein produced by the immune system in response to the presence in the body of antigens: foreign proteins or polysaccharides such as bacteria, bacterial toxins, viruses, or other cells or proteins. This consideration is:

- a) True**
- b) False

029. Immunosuppressive effect of glucocorticoids is caused by

- a) Reducing concentration of lymphocytes (T and B cells) and inhibiting function of tissue macrophages and other antigen-presenting cells**
- b) Suppression of cyclooxygenase II expression that results in reducing amount of an enzyme available to produce prostoglandins
- c) Activation of phospholipase A<sub>2</sub> and reducing prostaglandin and leukotriene synthesis
- d) All of the above

030. Antiallergic effect of glucocorticoids is caused by:

- a) Suppression of leukocyte migration and stabilizing lysosomal membranes
- b) Reverse the capillary permeability associated with histamine release
- c) Suppression of the immune response by inhibiting antibody synthesis
- d) All of the above**

031. The Immunosuppressive agent is:

- a) Corticosteroids
- b) Cyclosporine
- c) Tacrolimus (FK 506)
- d) All of the above**

032. Class of cyclosporine A is:

- a) Interferons
- b) Immunosuppressive agents**
- c) Monoclonal antibodies
- d) Immunoglobulins

033. Mechanism of action of cyclosporine A is:

- a) Complement-mediated cytolysis of T lymphocytes
- b) ADCC towards T lymphocytes
- c) Inhibits calcineurin**
- d) Compete for Fc receptors with autoantibodies

034. Side effect of cyclosporine A is:

- a) Tremor
- b) GI disturbance
- c) Hepatotoxicity
- d) All of the above**

035. Side effect of cyclosporine A is:

- a) Tremor**
- b) Anorexia
- c) Chills
- d) Myalgia

036. Side effect of cyclosporine A is:

- a) Diarrhea
- b) Headache
- c) GI disturbance**
- d) Immunosuppression

037. Indication of cyclosporine A is:

- a) Secondary immunodeficiency
- b) Hairy cell leukemia
- c) Primary immunodeficiency
- d) Idiopathic nephrotic syndrome**

**038.** Half-life of cyclosporine A is:

- a) 25-35 minutes
- b) 21 days
- c) 4 - 16 hours
- d) 19 hours**

**039.** Class of I.V. IgG preparation is:

- a) Monoclonal antibodies
- b) Immunosuppressive agents
- c) Interferons
- d) Immunoglobulins**

**040.** Mechanism of action of I.V. IgG preparation is:

- a) Inhibits CD3 receptor
- b) Inhibits calcineurin
- c) Complement-mediated cytolysis of T lymphocytes
- d) Compete for Fc receptors with autoantibodies**

**041.** Half-life of I.V. IgG preparation is:

- a) 25-35 minutes
- b) 19 hours
- c) 4 - 16 hours
- d) 21 days**

**042.** Indication for I.V. IgG preparation administration is:

- a) Kaposi's sarcoma
- b) Acute rejection of organ transplant
- c) Condyloma acuminatum
- d) Prophylaxis of certain infections**

**043.** Cytotoxic agents are the following EXCEPT:

- a) Azathioprine
- b) Cyclosporine**
- c) Leflunomide
- d) Cyclophosphamide

**044.** Class of sirolimus (rapamycin) is:

- a) Immunoglobulins
- b) Interferons
- c) Immunosuppressive agents**
- d) Monoclonal antibodies

**045.** Mechanism of action of sirolimus (rapamycin) is:

- a) Anti-idiotype antibodies against autoantibodies
- b) Modulation of CD3 receptor from the cell surface
- c) Inhibits calcineurin**
- d) ADCC towards T lymphocytes

**046.** Monoclonal antibodies is:

- a) Trastuzumab
- b) Rituximab
- c) OKT-3
- d) All of the above**

**047.** Class of OKT-3 is:

- a) Immunosuppressive agents
- b) Monoclonal antibodies**
- c) Interferons
- d) Immunoglobulins

**048.** Half-life of OKT-3 is:

- a) 18-24 hours**
- b) 25-35 minutes
- c) 4 - 16 hours
- d) 21 days

**049.** The indication for interferon gamma administration is:

- a) Idiopathic nephrotic syndrome

- b) Hepatitis C virus infection
- c) Chronic granulomatous disease**
- d) Hairy cell leukemia

**050.** The side effect of interferon gamma is:

- a) Hypertension
- b) Pulmonary edema
- c) Nephrotoxicity
- d) Fatigue**

**051.** Half-life of interferon gamma is:

- a) 21 days
- b) 19 hours
- c) 4 - 16 hours
- d) 25-35 minutes**

**052.** Half-life of interferon alpha is:

- a) 18-24 hours
- b) 4-16 hours**
- c) 25-35 minutes
- d) 21 days

**053.** The indication for interferon alpha administration is:

- a) Hepatitis C virus infection
- b) Kaposi's sarcoma
- c) Condyloma acuminatum
- d) All of the above**

**054.** Indication for interferon alpha administration is:

- a) Autoimmune diseases
- b) Rheumatoid arthritis
- c) Organ transplantation
- d) Hepatitis C virus infection**

**055.** Indication for interferon alpha administration is:

- a) Prophylaxis of sensitization by Rh antigen
- b) Rheumatoid arthritis
- c) Kaposi's sarcoma**
- d) Chronic granulomatous disease

**056.** Class of tacrolimus (FK-506) is:

- a) Immunoglobulins
- b) Immunosuppressive agents**
- c) Interferons
- d) Monoclonal antibodies

**057.** Mechanism of action of tacrolimus (FK-506) is:

- a) Inhibits CD3 receptor
- b) Complement-mediated cytolysis of T lymphocytes
- c) Substitution for patient's deficient immunoglobulins
- d) Inhibits calcineurin**

**058.** Immunomodulating agent is:

- a) Sirolimus (rapamycin)
- b) Levamisole**
- c) Tacrolimus (FK 506)
- d) All of the above

**059.** Immunomodulating agents are the following EXCEPT:

- a) Cytokines
- b) Levamisole
- c) BCG (Bacille Calmette-Guérin)
- d) Tacrolimus (FK-506)**

**060.** Mechanism of action of levamisole is:

- a) Inhibits CD3 receptor
- b) Complement-mediated cytolysis of T lymphocytes
- c) Substitution for patient's deficient immunoglobulins
- d) Increase the number of T-cells**

## PART VI Vitamins, Vitamin-like Compounds, Antivitamins, Enzymes & Antienzymes

001. Vitamins are:

- a) Inorganic nutrients needed in small quantities in the body
- b) Organic substances needed in very large quantities in the body
- c) Any of various fat-soluble or water-soluble organic substances essential in minute amounts for normal growth and activity of the body and obtained naturally from plant and animal foods**
- d) Products of endocrine gland secretion

002. Vitamin-like compounds are:

- a) A number of compounds, whose nutritional requirements exist at specific periods of development, particularly neonatal development, and periods of rapid growth**
- b) Inorganic nutrients needed in small quantities in body
- c) Organic substances needed in very large quantities in body
- d) Products of endocrine gland secretion

003. Antivitamins are:

- a) Any of various fat-soluble or water-soluble organic substances essential in minute amounts for normal growth and activity of the body and obtained naturally from plant and animal foods
- b) Substances that prevent vitamins from exerting their typical metabolic effects**
- c) Any of numerous proteins or conjugated proteins produced by living organisms and functioning as specialized catalysts for biochemical reactions
- d) Nonprotein organic substances that usually contain a vitamin or mineral and combine with a specific apoenzyme to form an active enzyme system

004. Coenzymes are:

- a) Any of various fat-soluble or water-soluble organic substances essential in minute amounts for normal growth and activity of the body and obtained naturally from plant and animal foods
- b) Substances that prevent vitamins from exerting their typical metabolic effects
- c) Any of numerous proteins or conjugated proteins produced by living organisms and functioning as specialized catalysts for biochemical reactions
- d) Nonprotein organic substances that usually contain a vitamin or mineral and combines with a specific apoenzyme to form an active enzyme system**

005. Antienzymes are:

- a) Agents, especially an inhibitory enzymes or an antibodies to enzymes, that retard, inhibit, or destroy enzymic activity**
- b) Substances that prevent vitamins from exerting their typical metabolic effects
- c) Any of numerous proteins or conjugated proteins produced by living organisms and functioning as specialized catalysts for biochemical reactions
- d) Nonprotein organic substances that usually contain a vitamin or mineral and combines with a specific apoenzyme to form an active enzyme system

006. Hypovitaminosis is an insufficiency of one or more essential vitamins. This consideration is:

- a) True**
- b) False

007. Hypervitaminosis is any of various abnormal conditions in which the physiological effect of a vitamin is produced to a pathological degree by excessive intake of the vitamin. This consideration is:

- a) True**
- b) False

008. Select a fat-soluble vitamin:

- a) Ascorbic acid
- b) Tocopherol**
- c) Thiamine
- d) Riboflavin

009. Select a water-soluble vitamin:

- a) Vitamin A
- b) Vitamin E
- c) Vitamin D
- d) Vitamin B<sub>1</sub>**

010. Which of the following vitamins can be also synthesized from a dietary precursor?

- a) Vitamin C
- b) Vitamin A**
- c) Vitamin B<sub>1</sub>
- d) Vitamin B<sub>6</sub>

011. Which of the following vitamins resembles with hormone

- a) Vitamin K

- b) Vitamin A
- c) Vitamin D**
- d) Vitamin E

012. Beri-beri is caused by the deficiency of:

- a) Riboflavin
- b) Ascorbic acid
- c) Nicotinic acid
- d) Thiamine**

013. Beri-beri is

- a) Disease caused by a deficiency of thiamine, endemic in eastern and southern Asia, and characterized by neurological symptoms, cardiovascular abnormalities, and edema. It is also called endemic neuritis**
- b) Inflammation at the corners of the mouth caused by a deficiency of riboflavin, associated with a wrinkled or fissured epithelium that does not involve the mucosa
- c) A disorder of the lips often due to riboflavin deficiency and other B-complex vitamin deficiencies and characterized by fissures, especially in the corners of the mouth
- d) All of the above

014. Deficiency symptom of riboflavin is:

- a) Cheilitis – inflammation of the lips or of a lip, with redness and the production of fissures radiating from the angles of the mouth
- b) Cheilosis – a disorder of the lips characterized by fissures, especially in the corners of the mouth
- c) Angular stomatitis, associated with a wrinkled or fissured epithelium that does not involve the mucosa
- d) All of the above**

015. All of the following statements concerning vitamin A functions are true EXCEPT:

- a) Transmission of light stimuli to the brain, via combination with a specific protein, opsin, to form a visual pigment, rhodopsin, in the retina of the eye
- b) Regulation of cell growth and differentiation in epithelium, connective tissues (including bone and cartilage) and hematopoietic tissues by retinoic acid, a highly bioactive metabolite of retinol
- c) Retinoic acid is especially important during embryogenesis
- d) Acts as a hormone involved in regulation of calcium and phosphorus homeostasis**

016. Deficiency symptom of vitamin A is:

- a) Night blindness – lessened ability to see in dim light
- b) Xerophthalmia and keratomalacia
- c) Various epithelial tissue defects, leading to decreased resistance to infective diseases, male and female infertility
- d) All of the above**

017. Xerophthalmia is:

- a) Extreme dryness of the conjunctiva resulting from a disease localized in the eye or from systemic deficiency of vitamin A**
- b) A condition, usually in children with vitamin A deficiency, characterized by softening and subsequent ulceration and perforation of the cornea
- c) A condition of the eyes in which vision is normal in daylight or other strong light but is abnormally weak or completely lost at night or in dim light and that results from vitamin A deficiency
- d) All of the above

018. Keratomalacia is:

- a) Extreme dryness of the conjunctiva resulting from a disease localized in the eye or from systemic deficiency of vitamin A
- b) A condition, usually in children with vitamin A deficiency, characterized by softening and subsequent ulceration and perforation of the cornea**
- c) A visual defect marked by the inability to see as clearly in bright light as in dim light
- d) All of the above

019. Night blindness (Hemeralopia, Nyctalopia) is

- a) Extreme dryness of the conjunctiva resulting from a disease localized in the eye or from systemic deficiency of vitamin A
- b) A condition, usually in children with vitamin A deficiency, characterized by softening and subsequent ulceration and perforation of the cornea
- c) A condition of the eyes in which vision is normal in daylight or other strong light but is abnormally weak or completely lost at night or in dim light and that results from vitamin A deficiency**
- d) All of the above

020. All of the following statements concerning vitamin E functions are true, EXCEPT:

- a) An extremely important antioxidant, which protects cell membrane lipids from peroxidation by breaking the chain reaction of free radical formation to which polyunsaturated fatty acids are particularly vulnerable
- b) Antisterility and antiabortion factor
- c) Specifically required for synthesis of prothrombin and several other clotting factors**

d) An essential for oxidative processes regulation

021. Which of the following statements concerning vitamin B1 functions are true:

- An extremely important antioxidant, which protects cell membrane lipids from peroxidation by breaking the chain reaction of free radical formation to which polyunsaturated fatty acids are particularly vulnerable
- An essential coenzyme for oxidative decarboxylate of alpha-keto acids, most important being conversion of pyruvate to acetyl coenzyme A**
- Specifically required for synthesis of prothrombin and several other clotting factors
- Essential constituent of the flavoproteins, flavin mononucleotide (FMN) and flavin adenine dinucleotide (FAD)

022. All of the following statements concerning vitamin B2 functions are true EXCEPT:

- Essential constituent of flavoproteins, flavin mononucleotide (FMN) and flavin adenine dinucleotide (FAD)
- Plays key roles in hydrogen transfer reactions associated with glycolysis, TCA cycle and oxidative phosphorylation
- An essential coenzyme for oxidative decarboxylate of alpha-keto acids, most important being conversion of pyruvate to acetyl coenzyme A**
- Deficiency symptoms are cheilitis, cheilosis and angular stomatitis

023. Which of the following statements concerning vitamin PP (B3, niacin) functions are true:

- Active group of the coenzymes nicotinamide-adenine dinucleotide (NAD) and nicotinamide-adenine phosphate (NADP)**
- An essential coenzyme for oxidative decarboxylate of alpha-keto acids, most important being conversion of pyruvate to acetyl coenzyme A
- Specifically required for synthesis of prothrombin and several other clotting factors
- Essential constituent of flavoproteins, flavin mononucleotide (FMN) and flavin adenine dinucleotide (FAD)

024. Which of the following statements concerning pyridoxine (vitamin B6) functions are true:

- Active functional form is pyridoxal phosphate, which is an essential coenzyme for transamination and decarboxylation of amino acids in more than 50 different enzyme systems**
- Active group of the coenzymes nicotinamide-adenine dinucleotide (NAD) and nicotinamide-adenine phosphate (NADP)
- Essential constituent of flavoproteins, flavin mononucleotide (FMN) and flavin adenine dinucleotide (FAD)
- An extremely important antioxidant, which protects cell membrane lipids from peroxidation by breaking the chain reaction of free radical formation to which polyunsaturated fatty acids are particularly vulnerable

025. Which of the following statements concerning pantothenic acid functions are true:

- Active functional form is pyridoxal phosphate, which is an essential coenzyme for transamination and decarboxylation of amino acids in more than 50 different enzyme systems
- Essential constituent of coenzyme A, the important coenzyme for acyl transfer in the TCA cycle and de novo fatty acid synthesis**
- An extremely important antioxidant, which protects cell membrane lipids from peroxidation by breaking the chain reaction of free radical formation to which polyunsaturated fatty acids are particularly vulnerable
- Coenzyme for several reactions involving  $\text{CO}_2$  fixation into various compounds e.g. acetyl CoA to malonyl CoA (acetyl CoA carboxylase) – initial step in de novo fatty acid synthesis; propionyl CoA to methylmalonyl CoA (propionyl CoA carboxylase), pyruvate to oxaloacetate (pyruvate carboxylase)

026. Which of the following statements concerning biotin functions are true:

- Active functional form is pyridoxal phosphate, which is an essential coenzyme for transamination and decarboxylation of amino acids in more than 50 different enzyme systems
- Essential constituent of coenzyme A, the important coenzyme for acyl transfer in the TCA cycle and de novo fatty acid synthesis
- An extremely important antioxidant, which protects cell membrane lipids from peroxidation by breaking the chain reaction of free radical formation to which polyunsaturated fatty acids are particularly vulnerable
- Coenzyme for several reactions involving  $\text{CO}_2$  fixation into various compounds e.g. acetyl CoA to malonyl CoA (acetyl CoA carboxylase) – initial step in de novo fatty acid synthesis; propionyl CoA to methylmalonyl CoA (propionyl CoA carboxylase), pyruvate to oxaloacetate (pyruvate carboxylase)**

027. Which of the following statements concerning vitamin B12 (cyanocobalamin) functions are true:

- Active functional form is pyridoxal phosphate, which is an essential coenzyme for transamination and decarboxylation of amino acids in more than 50 different enzyme systems
- Essential constituent of coenzyme A, the important coenzyme for acyl transfer in the TCA cycle and de novo fatty acid synthesis
- Coenzyme for numerous metabolic reaction, including transformation of methylmalonyl CoA to succinyl CoA in the metabolism of propionate; DNA synthesis (acts in concert with folic acid); transmethylation e.g. methionine synthesis from homocysteine**
- An extremely important antioxidant, which protects cell membrane lipids from peroxidation by breaking the chain reaction of free radical formation to which polyunsaturated fatty acids are particularly vulnerable

028. Which of the following statements concerning folic acid (folacin) functions are true:

- Active functional form is pyridoxal phosphate, which is an essential coenzyme for transamination and decarboxylation of amino acids in more than 50 different enzyme systems

- b) Essential constituent of coenzyme A, the important coenzyme for acyl transfer in the TCA cycle and de novo fatty acid synthesis
- c) **Carrier of one-carbon (e.g. methyl) groups that are added to, or removed from, metabolites such as histidine, serine, methionine, and purines**
- d) An extremely important antioxidant, which protects cell membrane lipids from peroxidation by breaking the chain reaction of free radical formation to which polyunsaturated fatty acids are particularly vulnerable

029. Which of the following statements concerning vitamin C functions are true:

- a) Active functional form is pyridoxal phosphate, which is an essential coenzyme for transamination and decarboxylation of amino acids in more than 50 different enzyme systems
- b) Essential constituent of coenzyme A, the important coenzyme for acyl transfer in the TCA cycle and de novo fatty acid synthesis
- c) Carrier of one-carbon (e.g. methyl) groups that are added to, or removed from, metabolites such as histidine, serine, methionine, and purines
- d) **Has antioxidant properties and is required for various hydroxylation reactions e.g. proline to hydroxypoline for collagen synthesis**

030. Dermatitis, diarrhoea and dementia are characteristics of:

- a) Dry beriberi
- b) Pyridoxine deficiency
- c) Scurvy
- d) **Pellagra**

031. Pellagra is:

- a) **A disease caused by a deficiency of niacin in the diet and characterized by skin eruptions, digestive and nervous system disturbances, and eventual mental deterioration**
- b) Inflammation of several nerves at one time caused by a deficiency of thiamin, marked by paralysis, pain, and muscle wasting. Also called multiple neuritis or polyneuritis
- c) A severe form of anemia most often affecting elderly adults, caused by a failure of the stomach to absorb vitamin B<sub>12</sub> and characterized by abnormally large red blood cells, gastrointestinal disturbances, and lesions of the spinal cord. Also called pernicious anemia, malignant anemia
- d) All of the above

032. Pernicious anemia is:

- a) **A severe form of anemia most often affecting elderly adults, caused by a failure of the stomach to absorb vitamin B<sub>12</sub> and characterized by abnormally large red blood cells, gastrointestinal disturbances, and lesions of the spinal cord**
- b) A form of anemia in which the capacity of the bone marrow to generate red blood cells is defective, caused by a bone marrow disease or exposure to toxic agents, such as radiation, chemicals, or drugs
- c) Anemia characterized by a decrease in the concentration of corpuscular hemoglobin
- d) All of the above

033. Rickets is:

- a) **A deficiency disease resulting from a lack of vitamin D or calcium and from insufficient exposure to sunlight, characterized by defective bone growth and occurring chiefly in children**
- b) A disease occurring primarily in adults that results from a deficiency in vitamin D or calcium and is characterized by a softening of the bones with accompanying pain and weakness
- c) A disease characterized by a decrease in bone mass and density, occurring especially in postmenopausal women, resulting in a predisposition to fractures and bone deformities such as a vertebral collapse
- d) All of the above

034. Scurvy is:

- a) **A disease caused by deficiency of vitamin C and characterized by spongy bleeding gums, bleeding under the skin, and weakness**
- b) Extreme dryness of the conjunctiva resulting from a disease localized in the eye or from systemic deficiency of vitamin A
- c) A disease caused by deficiency of niacin in the diet and characterized by skin eruptions, digestive and nervous system disturbances, and eventual mental deterioration
- d) All of the above

035. Which of the following vitamins is given along with isoniazide in treatment of tuberculosis?

- a) Nicotinic acid
- b) Riboflavin
- c) **Pyridoxine**
- d) Ascorbic acid

036. Which of the following vitamins is also known as an antisterility factor?

- a) **Vitamin E**
- b) Vitamin B<sub>6</sub>
- c) Vitamin B<sub>1</sub>

d) Vitamin K

037. Mega doses of which vitamin are some time beneficial viral respiratory infections

a) **Vitamin C**  
 b) Vitamin A  
 c) Vitamin K  
 d) Vitamin PP

038. Which of the following vitamins improves megaloblast anemia but does not protect the neurological manifestations of pernicious anemia?

a) **Vitamin B<sub>12</sub>**  
 b) Vitamin B<sub>C</sub>  
 c) Vitamin PP  
 d) Vitamin D

039. Vitamin K enhances the anticoagulant property of coumarins. This statement is:

a) True  
**b) False**

040. Loosening of teeth, gingivitis and hemorrhage occur in the deficiency of:

a) Vitamin K  
 b) Vitamin B<sub>1</sub>  
 c) Vitamin B<sub>6</sub>  
**d) Vitamin C**

041. Ingestion of polar bear liver may cause acute poisoning of:

a) Vitamin D  
 b) Vitamin E  
**c) Vitamin A**  
 d) Vitamin C

042. Which of the following antivitamins prevent a vitamin B<sub>6</sub> from exerting its typical metabolic effects?

a) Isoniazide  
 b) Ethanol  
 c) Carbamazepine  
**d) All of the above**

043. Which of the following antivitamins prevent a vitamin A from exerting its typical metabolic effects?

a) **Lipooxidase**  
 b) Oral contraceptives  
 c) Antibiotics  
 d) All of the above

044. Which of the following antivitamins prevent a vitamin K from exerting its typical metabolic effects?

a) Cholestiramine  
 b) Coumarins  
 c) Antibiotics  
**d) All of the above**

045. Which of the following coenzymes is of vitamin origin?

a) Riboxine  
 b) Coenzyme Q<sub>10</sub>  
**c) Piridixal-5-phosphate**  
 d) Lipoic acid

046. Which of the following coenzymes is not of vitamin origin?

a) Coenzyme Q<sub>10</sub>  
 b) Magnesium  
 c) Carnitine  
**d) All of the above**

047. These substances are vitamin-like compounds, EXCEPT:

a) Choline  
**b) Vitamin PP**  
 c) Vitamin U (methylmethioninesulfonil chloride)  
 d) Orotate acid

048. Which of the following substances is a vitamin-like compound?

a) Ascorbic acid  
**b) Taurine**  
 c) Thiamine  
 d) Riboflavin

049. Which of the following antienzymes is a proteolysis inhibitor?

**a) Contrical**  
 b) Sulbactam  
 c) Aminocaproic acid  
 d) Disulfiram

**050.** Which of the following antienzymes is a beta-lactamase inhibitor?  
 a) Clavulanic acid  
 b) Sulbactam  
 c) Tazobactam  
**d) All of the above**

**051.** Which of the following antienzymes is a fibrinolysis inhibitor?  
 a) Clavulanic acid  
 b) Sulbactam  
**c) Aminocaproic acid**  
 d) Disulfiram

**052.** Which of the following antienzymes is an aldehyde dehydrogenase inhibitor?  
 a) Tazobactam  
 b) Sulbactam  
 c) Aminocaproic acid  
**d) Disulfiram**

**053.** Which of the following antienzymes is a cholinesterase inhibitor?  
**a) Physostigmine**  
 b) Selegiline  
 c) Aminocaproic acid  
 d) Disulfiram

**054.** Which of the following antienzymes is a monoamine oxidase (MAO) inhibitor:  
 a) Physostigmine  
**b) Selegiline**  
 c) Acetazolamide  
 d) Disulfiram

**055.** Which of the following antienzymes is a carbonic anhydrase inhibitor:  
 a) Physostigmine  
 b) Selegiline  
 c) Aminocaproic acid  
**d) Acetazolamide**

**056.** Which of the following antienzymes is a xantine oxidase inhibitor?  
 a) Physostigmine  
**b) Allopurinol**  
 c) Aminocaproic acid  
 d) Acetazolamide

**057.** Which of the following antienzymes is an aromatase inhibitor used in cancer therapy?  
 a) Physostigmine  
 b) Allopurinol  
 c) Aminocaproic acid  
**d) Aminoglutethimide**

**058.** Which of the following enzymes improves GIT functions (replacement therapy):  
**a) Pepsin**  
 b) Urokinase  
 c) L-asparaginase  
 d) Lydaze

**059.** Which of the following enzymes has fibrinolytic activity?  
 a) Pepsin  
**b) Urokinase**  
 c) L-asparaginase  
 d) Lydaze

**060.** Which of the following enzymes is used in cancer therapy?  
 a) Pepsin  
 b) Urokinase  
**c) L-asparaginase**  
 d) Lydaze

**061.** Which of the following statements concerning nutritional supplement (dietary supplement) are True:

- a) Nutritional supplements are intended to supplement the diet and bear or contain one or more of the following dietary ingredients: a vitamin, a mineral, an herb or other botanical, an amino acid, a dietary substance for human use to supplement the diet by increasing the total daily intake (e.g., enzymes or tissue from organ or glands), a concentrate, such as a meal replacement or energy bar, a metabolite, constituent, or extract
- b) Nutritional supplements are regulated as foods, and not as drugs
- c) Nutritional supplements are not pre-approved on their safety and efficacy, unlike drugs
- d) All of the above**

**PART VII Antihyperlipidemic Drugs & Drugs Used In the Treatment of Gout**

001. Lipoprotein is:

- a) A conjugated protein having a lipid component; the principal means for transporting lipids in the blood**
- b) Any of various fat-soluble or water-soluble organic substances essential in minute amounts for normal growth and activity of the body and obtained naturally from plant and animal foods
- c) Product of endocrine gland secretion
- d) Mediators of inflammatory process

002. Very low density lipoprotein (VLDL) is:

- a) A lipoprotein containing a very large proportion of lipids to protein and carrying most cholesterol from the liver to the tissues**
- b) A lipoprotein that contains relatively high amounts of cholesterol and is associated with an increased risk of atherosclerosis and coronary artery disease. It is also called beta-lipoprotein
- c) A lipoprotein that contains relatively small amounts of cholesterol and triglycerides and is associated with a decreased risk of atherosclerosis and coronary artery disease. It is also called alpha-lipoprotein
- d) Large lipoprotein particle that is created by the absorptive cells of the small intestine. It transports lipids to adipose tissue where they are broken down by lipoprotein lipase

003. Low-density lipoprotein (LDL) is:

- a) A lipoprotein that contains relatively high amounts of cholesterol and is associated with an increased risk of atherosclerosis and coronary artery disease. It is also called beta-lipoprotein**
- b) A lipoprotein that contains relatively small amounts of cholesterol and triglycerides and is associated with a decreased risk of atherosclerosis and coronary artery disease. It is also called alpha-lipoprotein
- c) A lipoprotein containing a very large proportion of lipids to protein and carrying most cholesterol from the liver to the tissues
- d) Large lipoprotein particle that is created by the absorptive cells of the small intestine. It transports lipids to adipose tissue where they are broken down by lipoprotein lipase

004. High-density lipoprotein (HDL) is:

- a) A lipoprotein that contains relatively small amounts of cholesterol and triglycerides and is associated with a decreased risk of atherosclerosis and coronary artery disease. It is also called alpha-lipoprotein**
- b) A lipoprotein containing a very large proportion of lipids to protein and carrying most cholesterol from the liver to the tissues
- c) A lipoprotein that contains relatively high amounts of cholesterol and is associated with an increased risk of atherosclerosis and coronary artery disease. It is also called beta-lipoprotein
- d) Large lipoprotein particle that is created by the absorptive cells of the small intestine. It transports lipids to adipose tissue where they are broken down by lipoprotein lipase

005. Chylomicron is:

- a) A lipoprotein that contains relatively small amounts of cholesterol and triglycerides and is associated with a decreased risk of atherosclerosis and coronary artery disease. It is also called alpha-lipoprotein
- b) A lipoprotein containing a very large proportion of lipids to protein and carrying most cholesterol from the liver to the tissues
- c) A lipoprotein that contains relatively high amounts of cholesterol and is associated with an increased risk of atherosclerosis and coronary artery disease. It is also called beta-lipoprotein
- d) Large lipoprotein particle that is created by the absorptive cells of the small intestine. It transports lipids to adipose tissue where they are broken down by lipoprotein lipase**

006. Hyperlipoproteinemia is a condition marked by an abnormally high level of lipoproteins in the blood. This consideration is:

- a) True**
- b) False

007. Hypertriglyceridemia denotes high blood levels of triglycerides. It has been associated with atherosclerosis, even in the absence of hypercholesterolemia (high cholesterol levels). This consideration is:

- a) True**
- b) False

008. Hypercholesterolemia (or hypercholesterolemia) is an abnormally high concentration of cholesterol in the blood. This consideration is:

- a) True**
- b) False

009. Which of the following consideration about type I familial hyperlipoproteinemia is True:

- Type I familial hyperlipoproteinemia marked by the increased serum concentrations of chylomicrons and triglycerides, which decrease if the diet becomes fat free, decreased concentrations of high- and low-density lipoproteins, which increase if the diet is fat free, and decreased tissue lipoprotein lipase activity**
- Type I familial hyperlipoproteinemia characterized by increased serum concentrations of chylomicrons, pre-low-density lipoproteins, and triglycerides that are considered to be the result of a combination of fat and carbohydrate-induced hyperlipemia

010. Familial chylomicronemia (type I) is caused by deficiency in lipoprotein lipase activity. This consideration is:

- True**
- False

011. The Coronary Primary Prevention Trial (CPPT) demonstrated that treatment with a lipid-lowering drug could reduce the risk of death due to coronary heart disease. This consideration is:

- True**
- False

012. Women taking probucol (Lorelco) should wait for 6 months after cessation of therapy before becoming pregnant. This consideration is:

- True**
- False

013. Nicotinic acid (Niacin) plus a bile acid-binding resin has not proven effective in combating hyperlipidemia. This consideration is:

- True
- False**

014. The ideal therapy for patients with elevated levels of cholesterol would lower the serum concentration of LDL-cholesterol while raising the concentration of HDL-cholesterol. This consideration is:

- True**
- False

015. Agents, which lower levels of LDL-cholesterol, tend to promote regression of atherosclerotic plaques. This consideration is:

- True**
- False

016. Clofibrate (Atromid-S) is the drug of choice for treatment of broad-beta hyperlipidemia (type III). This consideration is:

- True
- False**

017. One advantage of gemfibrozil (Lopid) is that, in addition to lowering blood levels of most lipids, it raises the level of HDL cholesterol. This consideration is:

- True**
- False

018. Probuclol (Lorelco) appears to increase clearance of LDL cholesterol by a non-receptor mediated mechanism. This consideration is:

- True**
- False

019. All of the following statements concerning cholestyramine (Questran) are true, EXCEPT:

- It would not be a good choice for treating patients with familial hypertriglyceridemia (type IV)
- It is not well tolerated by patients
- It works by directly binding cholesterol in the blood**
- It is an effective drug for treatment of types IIa and IIb hyperlipidemia

020. All of the following statements concerning drugs which inhibit cholesterol synthesis are true, EXCEPT:

- They work in part by increasing the rate of LDL clearance from the plasma
- They are the most effective single agents for lowering LDL-cholesterol
- When used with a bile-acid binding resin, they can lower LDL-cholesterol by 50% or more
- No special monitoring is required in patients receiving one of them**

021. All of the following statements concerning nicotinic acid (Niacin) are true, EXCEPT:

- It reduces the rate of synthesis of VLDL
- Sustained-release preparations of this drug are largely free of side effects**
- Almost all patients taking the traditional dosage form of this drug experience uncomfortable flushing
- It should not be used with antihypertensives

022. All of the following statements concerning drugs which inhibit cholesterol synthesis are true, EXCEPT:

- When used alone, they are the most effective agents for lowering LDL cholesterol
- They are often effective in patients in whom a diet, with or without a bile acid-binding resin or niacin, has failed
- Lovastatin (Mevacor) plus a resin causes regression of coronary lesions in about one third of treated patients

**d) Members of this drug class are generally not as well tolerated as the older bile acid-binding resins**

023. All of the following statements concerning drugs which inhibit cholesterol synthesis are true, EXCEPT:

- a) These drugs should not be used in pregnant women or children
- b) These drugs often cause myopathy if used in combination with cyclosporine (Sandimmune)
- c) Failure to discontinue the drug after myopathy has been detected can cause acute renal failure
- d) Several of these drugs tend to lengthen the sleep cycle**

024. All of the following statements concerning the fibric acid derivatives are true, EXCEPT:

- a) Clofibrate (Atromid-S) is the drug of choice for therapy of Type III hyperlipidemia**
- b) Gemfibrozil (Lopid) increases HDL cholesterol while lowering LDL cholesterol
- c) Gemfibrozil (Lopid) has been shown to reduce mortality associated with a heart disease
- d) Gemfibrozil (Lopid) is generally well tolerated

025. All of the following statements concerning the bile acid-binding resins are true, EXCEPT:

- a) They decrease total cholesterol and LDL
- b) They are contraindicated in patients with hypertriglyceridemia
- c) When used alone, they do not slow the progression of atherosclerotic lesions**
- d) They are the drugs of choice for therapy of type II hyperlipidemia when used either alone or in combination with selected agents

026. All of the following statements concerning nicotinic acid (Niacin) are true, EXCEPT:

- a) Both triglycerides and LDL cholesterol are reduced by this drug
- b) The drug acts by directly decreasing the rate of synthesis of apoproteins**
- c) Doses higher than 3 gm/day are no longer used because of possible disturbances of hepatic or pancreatic functions
- d) Most patients taking this drug experience uncomfortable cutaneous flushing, itching, and/or rashes

027. All of the following statements concerning the general principles of therapy with lipid-lowering drugs are true EXCEPT:

- a) Therapy with a lipid-lowering drug should be always accompanied by an appropriate diet
- b) A lipid-lowering diet should be discontinued if it fails to decrease the levels of plasma LDL cholesterol by at least 10%**
- c) Lipid-lowering drugs should only be administered after at least 3 months of prior dietary therapy
- d) Some combinations of lipid-lowering drugs are synergistic

028. The cholesterol synthesis inhibitors increase the rate of clearance of LDL cholesterol from the plasma. This consideration is:

- a) True**
- b) False

029. Lovastatin (Mevacor) plus a bile-acid binding resin causes regression of coronary lesions in about one third of treated patients. This consideration is:

- a) True**
- b) False

030. The cholesterol synthesis inhibitors are better tolerated than most other lipid-lowering agents. This consideration is:

- a) True**
- b) False

031. Selected liver and muscle enzymes should be monitored during the use of any cholesterol synthesis inhibitors because of possible toxic effects. This consideration is:

- a) True**
- b) False

032. The bile acid-binding resins act by directly binding cholesterol and facilitating its excretion. This consideration is:

- a) True
- b) False**

033. Nicotinic acid (Niacin) acts by increasing the rate of catabolism of VLDL. This consideration is:

- a) True
- b) False**

034. Gemfibrozil (Lopid) can cause dizziness and syncope when used with antihypertensives. This consideration is:

- a) True
- b) False**

035. Gemfibrozil (Lopid) increases concentrations of HDL cholesterol more than clofibrate (Atromid-S). This consideration is:

- a) True**
- b) False

036. The bile acid-binding resins can bind many drugs and vitamins and reduce their absorption. This consideration is:

- a) True**
- b) False

037. When used alone, the bile acid-binding resins are contraindicated in patients with hypertriglyceridemia. This consideration is:

a) **True**  
 b) False

038. Combinations of lipid-lowering drugs are likely to be synergistic if they work at different steps in the same pathway. This consideration is:  
 a) **True**  
 b) False

039. Reduction in plasma triglycerides and LDL cholesterol concentrations with gemfibrozil treatment is greater than reduction in plasma cholesterol and LDL cholesterol concentrations with gemfibrozil treatment. This consideration is:  
 a) **True**  
 b) False

040. Patients with homozygous familial hypercholesterolemia (type IIa) lack any functional LDL receptors on their hepatocytes. This consideration is:  
 a) **True**  
 b) False

041. Effects of drugs in lowering blood cholesterol levels are additive with those of diet. This consideration is:  
 a) **True**  
 b) False

042. HMG-CoA reductase inhibiting drugs can cause muscle breakdown, especially when used in combination with a cyclosporine. This consideration is:  
 a) **True**  
 b) False

043. Probucol (Lorelco) reduces the risk of atherosclerosis by stimulating the rate of clearance of LDL by receptor-mediated pathways. This consideration is:  
 a) True  
 b) **False**

044. Clofibrate (Atromid-S) is generally regarded as superior to gemfibrozil.  
 a) True  
 b) **False**

045. Niacin's most common side effects can be reduced by pretreatment with aspirin and/or by taking the drug at the end of meals. This consideration is:  
 a) **True**  
 b) False

046. The major side effect of cholestyramine is hepatotoxicity. This consideration is:  
 a) True  
 b) **False**

047. The statins are dependent on the presence of LDL receptors on hepatocytes in order to exert their effect. This consideration is:  
 a) True  
 b) **False**

048. This drug increases lipoprotein lipase (LPL) activity in adipose tissue:  
 a) Cholestyramine (Questran)  
 b) Lovastatin (Mevacor)  
 c) Nicotinic acid (Niacin)  
 d) **Gemfibrozil (Loprol)**

049. This drug both inhibits an enzyme and indirectly enhances clearance of low density lipoproteins (LDL):  
 a) Cholestyramine (Questran)  
 b) **Lovastatin (Mevacor)**  
 c) Nicotinic acid (niacin)  
 d) Probucol (Lorelco)

050. This drug binds bile acids in the GI tract:  
 a) **Cholestyramine (Questran)**  
 b) Nicotinic acid (niacin)  
 c) Gemfibrozil (Loprol)  
 d) Probucol (Lorelco)

051. This drug may block oxidation of low density lipoproteins (LDL):  
 a) Lovastatin (Mevacor)  
 b) Nicotinic acid (niacin)  
 c) Gemfibrozil (Loprol)  
 d) **Probucol (Lorelco)**

052. This drug weakly stimulates synthesis of very low density lipoproteins (VLDL):

**a) Cholestyramine (Questran)**  
 b) Lovastatin (Mevacor)  
 c) Gemfibrozil (Loprol)  
 d) Probucol (Lorelco)

**053.** Flushing caused by this drug can be reduced by taking it after meals and/or by pretreatment with aspirin:  
 a) Lovastatin (Mevacor)  
**b) Nicotinic acid (niacin)**  
 c) Gemfibrozil (Loprol)  
 d) Probucol (Lorelco)

**054.** This drug can cause muscle damage, especially when used with any of several drugs including erythromycin:  
 a) Cholestyramine (Questran)  
**b) Lovastatin (Mevacor)**  
 c) Gemfibrozil (Loprol)  
 d) Probucol (Lorelco)

**055.** This drug decreases blood levels of high density lipoproteins (HDL):  
 a) Lovastatin (Mevacor)  
 b) Nicotinic acid (niacin)  
 c) Gemfibrozil (Loprol)  
**d) Probucol (Lorelco)**

**056.** This fibric acid derivative increases blood levels of high density lipoproteins (HDL):  
 a) Cholestyramine (Questran)  
 b) Lovastatin (Mevacor)  
**c) Gemfibrozil (Loprol)**  
 d) Probucol (Lorelco)

**057.** Gout is a familial metabolic disease characterized by recurrent episodes of acute arthritis due to deposits of monosodium urate in joints and cartilage. This consideration is:  
**a) True**  
 b) False

**058.** Probenecid and sulfipyrazone are uricosuric drugs employed to decrease the body pool of urate in patients with tophaceous gout or in those with increasingly frequent gouty attacks. This consideration is:  
**a) True**  
 b) False

**059.** Which of the following drugs is an uricosuric agent:  
 a) Allopurinol  
**b) Sulfipyrazone**  
 c) Colchicine  
 d) Indomethacin

**060.** Uricosuric drugs are the following, EXCEPT:  
 a) Probenecid  
 b) Sulfipyrazone  
**c) Colchicine**  
 d) Aspirin (at high dosages)

**061.** Which of the following drugs used in the treatment of gout acts by preventing the migration of granulocytes:  
 a) Allopurinol  
 b) Sulfipyrazone  
**c) Colchicine**  
 d) Indomethacin

**062.** Which of the following drugs used in the treatment of gout has as its primary effect the reduction of uric acid synthesis  
**a) Allopurinol**  
 b) Sulfipyrazone  
 c) Colchicine  
 d) Indomethacin

**063.** Characteristics of probenecid include all of the following, EXCEPT:  
**a) It promotes the renal tubular secretion of penicillin**  
 b) It is useful in the treatment of gout  
 c) At appropriate doses, it promotes the excretion of uric acid  
 d) The metabolic products of probenecid are uricosuric

#### **PART VIII Agents That Affect Bone Mineral Homeostasis**

**001.** Action of the parathyroid hormone is:

- a) Increased calcium and phosphate absorption in intestine (by increased 1,25-dihydroxyvitamin D<sub>3</sub> production)
- b) Decreased calcium excretion and increased phosphate excretion in kidneys
- c) In bone, calcium and phosphate resorption increased by high doses. Low doses may increase bone formation.
- d) All of the above**

002. The parathyroid hormone increases serum calcium and decreases serum phosphate. This consideration is:

- a) True**
- b) False.

003. The following statements about the parathyroid hormone are true, EXCEPT:

- a) The parathyroid hormone (PTH) is a single-chain peptide hormone composed of 84 amino acids
- b) The parathyroid hormone increases calcium and phosphate absorption in intestine (by increased 1,25-dihydroxyvitamin D<sub>3</sub> production)
- c) The parathyroid hormone increases serum calcium and decreases serum phosphate
- d) The parathyroid hormone increases calcium excretion and decreases phosphate excretion in kidneys**

004. Which of the following statements about calcitonin is true:

- a) Calcitonin secreted by parafollicular cells of the mammalian thyroid is a single-chain peptide hormone with 32 amino acids
- b) Effects of calcitonin are to lower serum calcium and phosphate by acting on bones and kidneys.
- c) Calcitonin inhibits osteoclastic bone resorption.
- d) All of the above**

005. Mechanism of action of calcitonin is:

- a) Inhibits hydroxyapatite crystal formation, aggregation, and dissolution
- b) Raises intracellular cAMP in osteoclasts**
- c) Activates bone resorption
- d) Inhibits macrophages

006. Indications for calcitonin administration are the following, EXCEPT:

- a) Hypercalcemia
- b) Paget's disease
- c) Hypophosphatemia**
- d) Osteoporosis

007. Side effect of calcitonin is:

- a) Hypercalcemia
- b) Metastatic calcifications
- c) Tetany**
- d) GI toxicity

008. Side effect of calcitonin is:

- a) Pruritus
- b) Hypotension**
- c) Fractures
- d) Hypocalcemia

009. Glucocorticoid hormones alter bone mineral homeostasis:

- a) By antagonizing vitamin D-stimulated intestinal calcium transport
- b) By stimulating renal calcium excretion
- c) By increasing parathyroid hormone stimulated bone resorption
- d) By all of the above**

010. Estrogens can prevent accelerated bone loss during the immediate postmenopausal period and at least transiently increase bone in the postmenopausal subject. This consideration is:

- a) True**
- b) False

011. Action of vitamin D<sub>3</sub> is:

- a) Increased calcium and phosphate absorption by 1,25-dihydroxyvitamin D<sub>3</sub>
- b) Calcium and phosphate excretion may be decreased by 25-hydroxyvitamin D<sub>3</sub> and 1,25-dihydroxyvitamin D<sub>3</sub>
- c) Increased calcium and phosphate resorption by 1,25-dihydroxyvitamin D<sub>3</sub>; bone formation may be increased by 25,24-dihydroxyvitamin D<sub>3</sub>
- d) All of the above**

012. Vitamin D<sub>3</sub> increases serum calcium and phosphate. This consideration is:

- a) True**
- b) False

013. Route of administration of vitamin D<sub>3</sub> is:

- a) Subcutaneous
- b) Oral**
- c) Intravenous

d) Intranasal

**014.** Side effect of vitamin D3 is:

- Defective bone mineralization
- Metastatic calcifications
- Hepatic toxicity
- Nephrolithiasis**

**015.** Indication of vitamin D3 is:

- Hypercalcemia
- Paget's disease
- Hypophosphatemia**
- Osteomalacia

**016.** 25-hydroxyvitamin D3 (calcifediol) is less effective than 1,25-dihydroxyvitamin D3 (calcitriol) in stimulating intestinal calcium transport, so that hypercalcemia is less of a problem with calcifediol. This consideration is:

- True**
- False

**017.** Route of administration of 25-hydroxyvitamin D3 (calcifediol) is:

- Oral**
- Subcutaneous
- Intravenous
- Intranasal

**018.** Indication for 25-hydroxyvitamin D3 (calcifediol) administration is:

- Primary hyperparathyroidism
- Rickets
- Hypercalcemia
- Failure of vitamin D formation in skin**

**019.** Side effect of 25-hydroxyvitamin D3 (calcifediol) is:

- Hypercalcemia
- Pruritus
- GI toxicity
- All of the above**

**020.** Indications for 1,25-dihydroxyvitamin D3 (calcitriol) administration are the following, EXCEPT:

- Hypocalcemia in chronic renal failure
- Vitamin D-dependent rickets
- Malabsorption of vitamin D from intestine
- Elevated skeletal turnover**

**021.** Indication for 1,25-dihydroxyvitamin D3 (calcitriol) administration is:

- Vitamin D resistance
- Elevated skeletal turnover
- Hypercalcemia of malignancy
- Hypophosphatemia**

**022.** The following statement refers to 1,25-dihydroxyvitamin D3 (calcitriol):

- When rapidity of action is required, 1,25-dihydroxyvitamin D<sub>3</sub> (calcitriol), 0.25-1 µg daily, is the vitamin D metabolite of choice, since it is capable of raising serum calcium within 24-48 hours
- Calcitriol also raises serum phosphate, though this action is usually not observed early in treatment
- Undergoes enterohepatic circulation
- All of the above**

**023.** Which of the following statements refers to 1,25-dihydroxyvitamin D3 (calcitriol):

- The combined effect of calcitriol and all other vitamin D metabolites and analogs on both calcium and phosphate makes careful monitoring of the level of these minerals especially important to avoid ectopic calcification**
- Does not undergo enterohepatic circulation
- Toxic to osteoclasts
- Bioavailability increases with the administered dose

**024.** Route of administration of 1,25-dihydroxyvitamin D3 (calcitriol) is:

- Subcutaneous
- Intravenous
- Intranasal
- Oral**

**025.** Commercially available analogs of 1,25-dihydroxyvitamin D3 (calcitriol) are:

- Doxercalciferol (Hectoral)
- Paricalcitol (Zemplar)

**c) All of the above**  
**d) None of the above**

**026.** Side effect of dihydrotachysterol is:  
 a) Hepatic toxicity  
 b) General malaise  
 c) Lymphocytopenia  
**d) Hypertension**

**027.** Route of administration of dihydrotachysterol is:  
 a) Intravenous  
 b) Subcutaneous  
**c) Oral**  
 d) Intranasal

**028.** Which of the following statements refers to cholecalciferol:  
 a) Frequent monitoring of both calcium and phosphorus serum levels is necessary in case of intravenous administration  
 b) Has potent anti-osteoclast activity – mechanism unknown  
 c) Can usually lower serum calcium levels in 48 hours  
**d) Mechanism of action: 1. Genomic effects 2. Cytoplasmic effects**

**029.** Indication for cholecalciferol administration is:  
 a) Hypercalcemia  
 b) Parathyroid hormone deficiency  
 c) Primary hyperparathyroidism  
**d) Malabsorption of vitamin D from intestine**

**030.** Route of administration of cholecalciferol is:  
 a) Subcutaneous  
 b) Intranasal  
 c) Intravenous  
**d) Oral**

**031.** The unwanted effect of cholecalciferol is:  
 a) Defective bone mineralization  
 b) Lymphocytopenia  
**c) CNS toxicity**  
 d) Metastatic calcifications

**032.** The unwanted effect of dihydrotachysterol is:  
 a) Tetany  
 b) Anorexia  
**c) CNS toxicity**  
 d) Lymphocytopenia

**033.** Indication for dihydrotachysterol administration is:  
 a) Parathyroid hormone resistance  
 b) Paget's disease  
 c) Increased osteolysis  
**d) Hypophosphatemia**

**034.** Conditions associated with hypophosphatemia include:  
 a) Primary hyperparathyroidism  
 b) Vitamin D deficiency  
 c) Idiopathic hypercalciuria  
**d) All of the above.**

**035.** The long-term effects of hypophosphatemia include proximal muscle weakness and abnormal bone mineralization (osteomalacia). This consideration is:  
**a) True**  
 b) False

**036.** Recommended phosphorus daily allowance is:  
**a) 900-1200 mg**  
 b) 600-900 g  
 c) 25 g  
 d) 1.5-4 mg

**037.** Interactions with other drugs of phosphorus is:  
 a) Amiloride: decrease renal excretion  
 b) Glucocorticoids: decrease absorption  
 c) Loop diuretics: increase renal excretion  
**d) Calcitonin: increases renal excretion**

038. Indication for pamidronate administration is:

- a) Failure of vitamin D formation in skin
- b) Hypoparathyroidism
- c) Elevated skeletal turnover
- d) Hypercalcemia**

039. Route of administration of pamidronate is:

- a) Oral
- b) Subcutaneous
- c) Intranasal
- d) Intravenous**

040. Correct statements about pamidronate include all of the following, EXCEPT:

- a) Because it causes gastric irritation, pamidronate is not available as an oral preparation
- b) Skeletal half-life is 24 h**
- c) Fever and lymphocytopenia are reversible
- d) Can be irritable to the esophagus if not washed promptly to the stomach

041. Route of administration of alendronate is:

- a) Intravenous
- b) Subcutaneous
- c) Oral**
- d) Intranasal

042. Correct statements about alendronate include all of the following, EXCEPT:

- a) Can be irritable to the esophagus if not washed promptly to the stomach
- b) 1st generation biphosphonate**
- c) Reduces osteoclast activity without significantly affecting osteoblasts; useful in the treatment of Paget's disease
- d) More potent than EHDP; has a wider therapeutic window

043. Indications of alendronate are the following, EXCEPT:

- a) Hypoparathyroidism**
- b) Glucocorticoid-induced osteoporosis
- c) Paget's disease
- d) Syndromes of ectopic calcification

044. Indication for etidronate administration is:

- a) Malabsorption of vitamin D from intestine
- b) Paget's disease**
- c) Vitamin D deficiency in a diet
- d) Hypercalciuria

045. Indications for etidronate administration are the following, EXCEPT:

- a) Paget's disease
- b) Osteoporosis
- c) Hypophosphatemia**
- d) Hypercalcemia

046. Which of the following statements refers to etidronate:

- a) Reduces osteoclast activity without significantly affecting osteoblasts; useful in treatment of Paget's disease
- b) Serum phosphorus concentrations should be monitored at least daily in case of oral administration
- c) 2nd generation biphosphonate (amino-biphosphonate)
- d) Bioavailability increases with the administered dose**

047. Correct statements about etidronate include all of the following, EXCEPT:

- a) Skeletal half-life is hundreds of days
- b) Bioavailability increases with the administered dose
- c) 2nd generation biphosphonate (amino-biphosphonate)**
- d) 1st generation biphosphonate.

048. Unwanted effect of etidronate is:

- a) Anorexia
- b) Defective bone mineralization**
- c) Hypercalcemia
- d) Cardiac arrhythmias

049. The major causes of hypocalcemia in the adult are:

- a) Hypoparathyroidism
- b) Vitamin D deficiency
- c) Renal failure and malabsorption
- d) All of the above**

050. The major causes of hypercalcemia in the adult are the following, EXCEPT :

- a) Hyperparathyroidism
- b) Cancer with or without bone metastases
- c) Renal failure and malabsorption**
- d) Hypervitaminosis D

**051.** Which of the following statements refers to calcium:

- a) Recommended Ca daily allowance for males: 1. 1-10 years: 800 mg 2. 11-18 years: 1200 mg 3. 19-50 years: 1000 mg 4. > 51 years: 1000 mg
- b) Ca chloride is very irritating and can cause necrosis if extravasated
- c) In achlorhydric patients calcium carbonate should be given with meals to increase absorption or patient switched to calcium citrate, which is somewhat better absorbed
- d) All of the above**

**052.** Indication for calcium administration is:

- a) Failure of formation of vitamin D in skin
- b) Malabsorption of vitamin D from intestine
- c) Hypercalcemia of malignancy
- d) Vitamin D deficiency**

**053.** Which of the calcium preparations is the most preferable for IV injection

- a) Calcium gluceptate (0.9 meq calcium/mL)
- b) Calcium gluconate (0.45 meq calcium/mL)**
- c) Calcium chloride (0.68-1.36 meq calcium/mL)
- d) All of the above

**054.** Which of the oral calcium preparations is often the preparation of choice:

- a) Calcium carbonate (40% calcium)**
- b) Calcium lactate (13% calcium)
- c) Calcium phosphate (25% calcium)
- d) Calcium citrate (17% calcium)

**055.** Interactions with other drugs of calcium is:

- a) Ethanol: decreases absorption
- b) Loop diuretics: increase renal excretion
- c) Glucocorticoids: stimulate renal excretion
- d) All of the above**

**056.** Correct statements about magnesium include all of the following, EXCEPT:

- a) Magnesium is mainly an intracellular cation, and is the fourth most abundant cation in the body
- b) The recommended dietary amounts of magnesium have been set at 6 mg/kg day (350-400 mg)
- c) The most common specific causes encountered in clinical practice are: diet, alcoholism (drinking), diarrhea and malabsorption, diabetes mellitus, diuretics, and drugs such as aminoglycosides and amphotericin
- d) It is a physiological calcium agonist**

**057.** Recommended magnesium daily allowance is:

- a) 350-400 mg**
- b) 6-9 g
- c) 25 g
- d) 1.5-4 mg

**058.** The major causes of hypomagnesaemia are:

- a) Insufficient dietary intake, e.g. malnutrition
- b) Abnormal gastrointestinal loss, e.g. severe diarrhea or chronic alcoholism
- c) Abnormal renal loss, e.g. diabetes mellitus or during therapy with some kind of drugs such as amphotericin B, gentamicin, cisplatin, cardiac glycosides, distal and loop diuretics
- d) All of the above**

**059.** Which of the magnesium preparation is the most preferable for I.V. injection

- a) Magnesium sulfate
- b) Magnesium chloride**
- c) Magnesium glutamate
- d) All of the above

**060.** Which of the oral magnesium preparations is often the preparation of choice:

- a) Magnesium lactate
- b) Magnesium oxide
- c) MagneB<sub>6</sub> (Mg pidolate / Mg lactate + pyridoxine hydrochloride)**
- d) All of the above.

**061.** Correct statements about fluoride include all of the following, EXCEPT:

- a) Fluoride is effective for the prophylaxis of dental caries
- b) Fluoride is accumulated by bone and teeth, where it may stabilize the hydroxyapatite crystal

**c) Subjects living in areas with naturally fluoridated water (1-2 ppm) had more dental caries and fewer vertebral compression fractures than subjects living in nonfluoridated water areas**

d) Chronic exposure to very high level of fluoride dust in the inspired air results in crippling fluorosis, characterized by thickening of the cortex of long bones and bony exostoses.

**062.** Recommended fluoride daily allowance is:

- 1.5-4 mg
- 600-900 g
- 25 g
- 350-400 mg

**063.** Which of the following statements refers to gallium nitrate:

- It is approved by the FDA for the management of hypercalcemia of malignancy
- This drug acts by inhibiting bone resorption
- Because of potential nephrotoxicity, patients should be well-hydrated and have good renal output before starting the infusion
- All of the above**

**064.** Which of the following statements refers to plicamycin (formerly mithramycin):

- Duration of action is usually several days
- Mechanism of cytotoxic action appears to involve its binding to DNA, possibly through an antibiotic-Mg<sup>2+</sup> complex.
- The drug causes plasma calcium levels to decrease, apparently through an action on osteoclasts that is independent of its action on tumor cells and useful in hypercalcemia.
- All of the above.**

**065.** Unwanted effects of plicamycin (formerly mithramycin) are the following, EXCEPT:

- Thrombocytopenia
- GI toxicity
- Bleeding disorders
- Fractures**

**066.** Unwanted effect of plicamycin (formerly mithramycin) is:

- Diarrhea
- Myelosuppression**
- Nephrolithiasis
- Metastatic calcifications

**067.** Indication for plicamycin (formerly mithramycin) administration is:

- Testicular cancers refractory to standard treatment
- Paget's disease
- Hypercalcemia of malignancy
- All of the above**

**068.** Route of administration of plicamycin is:

- Intravenous**
- Subcutaneous
- Intranasal
- Oral

**PART IX Mineralocorticoid, Mineralocorticoid Antagonists, Diuretics, Plasma Expanders**

**001.** Mineralocorticoid effects cause:

- Increased catabolism
- Increased Na retention and K excretion**
- Increased gluconeogenesis
- Deposition of fat on shoulders, face and abdomen

**002.** Which of the following synthetic steroids shows predominantly mineralocorticoid action?

- Hydrocortisone
- Spirolactone
- Dexamethasone
- Fludrocortisone**

**003.** The major mineralocorticoids are the following, EXCEPT:

- Aldosterone
- Deoxycorticosterone
- Fludrocortisone
- Hydrocortisone**

**004.** Which of the following statements about spironolactone is TRUE?

- Spironolactone reverses many of the manifestations of aldosteronism
- Spironolactone is also an androgen antagonist and as such is used in the treatment of hirsutism in women

c) Spironolactone is useful as a diuretic  
**d) All of the above**

**005.** All of the following statements regarding diuretics are true, EXCEPT:

- Carbonic anhydrase inhibition leads to increased reabsorption of  $\text{NaHCO}_3$**
- Loop diuretics decrease  $\text{Na}^+$  reabsorption at the loop of Henle by competing for the  $\text{Cl}^-$  site on the  $\text{Na}^+/\text{K}^+/\text{2Cl}^-$  cotransporter
- In general, the potency of a diuretic is determined by where it acts in the renal tubule
- Hydrochlorothiazide decreases urinary calcium excretion

**006.** The drug inhibits the ubiquitous enzyme carbonic anhydrase:

- Acetazolamide (Diamox)**
- Furosemide (Lasix)
- Hydrochlorothiazide (HydroDiuril)
- Spironolactone (Aldactone)

**007.** The drug acts by competitively blocking  $\text{NaCl}$  cotransporters in the distal tubule:

- Acetazolamide (Diamox)
- Furosemide (Lasix)
- Hydrochlorothiazide (HydroDiuril)**
- Spironolactone (Aldactone)

**008.** The drug acts at the proximal tubule:

- Acetazolamide (Diamox)**
- Furosemide (Lasix)
- Hydrochlorothiazide (HydroDiuril)
- Spironolactone (Aldactone)

**009.** The drug acts by competing with aldosterone for its cytosolic receptors:

- Acetazolamide (Diamox)
- Furosemide (Lasix)
- Hydrochlorothiazide (HydroDiuril)
- Spironolactone (Aldactone)**

**010.** The drug is a potassium-sparing diuretic that blocks  $\text{Na}^+$  channels in the collecting tubules:

- Acetazolamide (Diamox)
- Amiloride (Midamor)**
- Furosemide (Lasix)
- Hydrochlorothiazide (HydroDiuril)

**011.** Chronic use of this drug can lead to distal tubular hypertrophy, which may reduce its diuretic effect:

- Acetazolamide (Diamox)
- Amiloride (Midamor)
- Furosemide (Lasix)**
- Hydrochlorothiazide (HydroDiuril)

**012.** The drug has a steroid-like structure which is responsible for its anti-androgenic effect:

- Amiloride (Midamor)
- Furosemide (Lasix)
- Hydrochlorothiazide (HydroDiuril)
- Spironolactone (Aldactone)**

**013.** Sustained use of this drug results in increased plasma urate concentrations:

- Furosemide (Lasix)**
- Acetazolamide (Diamox)
- Both of the above
- Neither of the above

**014.** The drug can be used to treat glaucoma:

- Furosemide (Lasix)
- Acetazolamide (Diamox)**
- Both of the above
- Neither of the above

**015.** The drug can cause ototoxicity:

- Furosemide (Lasix)**
- Acetazolamide (Diamox)
- Both of the above
- Neither of the above

**016.** The drug acts only on the luminal side of renal tubules:

- Furosemide (Lasix)**
- Acetazolamide (Diamox)

- c) Both of the above
- d) Neither of the above

017. The drug can promote sodium loss in patients with low (e.g., 40 ml/min) glomerular filtration rates:

- a) **Furosemide (Lasix)**
- b) Acetazolamide (Diamox)
- c) Both of the above
- d) Neither of the above

018. The drug needs aldosterone present in order to be effective:

- a) Hydrochlorothiazide (HydroDiuril)
- b) Amiloride (Midamor)
- c) Both of the above
- d) Neither of the above**

019. The drug can be used to treat nephrogenic diabetes insipidus:

- a) Hydrochlorothiazide (HydroDiuril)**
- b) Amiloride (Midamor)
- c) Both of the above
- d) Neither of the above

020. The drug is sometimes part of fixed-dose combinations used to treat essential hypertension:

- a) Hydrochlorothiazide (HydroDiuril)
- b) Amiloride (Midamor)
- c) Both of the above**
- d) Neither of the above

021. The drug should never be administered to patients taking potassium supplements:

- a) Hydrochlorothiazide (HydroDiuril)
- b) Amiloride (Midamor)**
- c) Furosemide (Lasix)
- d) Neither of the above

022. The drug decreases calcium excretion in urine:

- a) Hydrochlorothiazide (HydroDiuril)**
- b) Amiloride (Midamor)
- c) Furosemide (Lasix)
- d) Acetazolamide (Diamox)

023. The drug acts by competitively blocking the  $\text{Na}^+/\text{K}^+/2\text{Cl}^-$  cotransporter:

- a) Loop diuretics**
- b) Thiazide diuretics
- c) Potassium-sparing diuretics
- d) Carbonic anhydrase inhibitors

024. The drug acts at the proximal tubule:

- a) Loop diuretics
- b) Thiazide diuretics
- c) Potassium-sparing diuretics
- d) Carbonic anhydrase inhibitors**

025. The drug acts in the distal convoluted tubule:

- a) Loop diuretics
- b) Thiazide diuretics**
- c) Potassium-sparing diuretics
- d) Carbonic anhydrase inhibitors

026. The drug acts in the collecting tubules:

- a) Loop diuretics
- b) Thiazide diuretics
- c) Potassium-sparing diuretics**
- d) Carbonic anhydrase inhibitors

027. The drug is the most potent diuretic:

- a) Loop diuretics**
- b) Thiazide diuretics
- c) Potassium-sparing diuretics
- d) Carbonic anhydrase inhibitors

028. The drug acts by competitively blocking the  $\text{NaCl}$  cotransporter:

- a) Loop diuretics
- b) Thiazide diuretics**
- c) Potassium-sparing diuretics

d) Carbonic anhydrase inhibitors

029. The drug inhibits sodium and chloride transport in the cortical thick ascending limb and the early distal tubule:

- Acetazolamide (Diamox)
- Furosemide (Lasix)
- Hydrochlorothiazide (Hydrodiuril)**
- Amiloride (Midamor)

030. The drug can cause ototoxicity:

- Acetazolamide (Diamox)
- Furosemide (Lasix)**
- Hydrochlorothiazide (Hydrodiuril)
- Amiloride (Midamor)

031. The drug blocks the sodium/potassium/chloride cotransporter in the thick ascending loop of Henle:

- Acetazolamide (Diamox)
- Furosemide (Lasix)**
- Hydrochlorothiazide (Hydrodiuril)
- Amiloride (Midamor)

032. The drug is one of the most potent diuretics:

- Acetazolamide (Diamox)
- Furosemide (Lasix)**
- Hydrochlorothiazide (Hydrodiuril)
- Amiloride (Midamor)

033. The drug is usually given in combination with a thiazide diuretic:

- Acetazolamide (Diamox)
- Furosemide (Lasix)
- Hydrochlorothiazide (Hydrodiuril)
- Amiloride (Midamor)**

034. All of the following statements regarding diuretics are true EXCEPT:

- Furosemide (Lasix) can increase the likelihood of digitalis toxicity
- Chlorthalidone (Hygroton) can decrease the excretion of lithium
- Ibuprofen can increase the antihypertensive effect of chlorthalidone**
- Chlorthalidone has a longer duration of action than furosemide

035. The drug is the least potent diuretic:

- Osmotic diuretics
- Loop diuretics
- Thiazide diuretics
- Potassium-sparing diuretics**

036. These agents must be given parenterally because they are not absorbed when given orally:

- Osmotic diuretics**
- Loop diuretics
- Thiazide diuretics
- Potassium-sparing diuretics

037. These drugs may be used in the treatment of recurrent calcium nephrolithiasis:

- Osmotic diuretics
- Loop diuretics**
- Thiazide diuretics
- Potassium-sparing diuretics

038. Furosemide (Lasix) acts at this nephron site:

- Proximal convoluted tubule
- Ascending thick limb of the loop of Henle**
- Distal convoluted tubule
- Collecting duct

039. Metolazone (Mykrox) acts at this nephron site:

- Proximal convoluted tubule
- Ascending thick limb of the loop of Henle
- Distal convoluted tubule**
- Collecting duct

040. Acetazolamide (Diamox) acts at this nephron site:

- Proximal convoluted tubule**
- Ascending thick limb of the loop of Henle
- Distal convoluted tubule
- Collecting duct

041. Spironolactone (Aldactone) acts at this nephron site:  
 a) Proximal convoluted tubule  
 b) Ascending thick limb of the loop of Henle  
 c) Distal convoluted tubule  
**d) Collecting duct**

042. Amiloride (Midamone) acts at this nephron site:  
 a) Proximal convoluted tubule  
 b) Ascending thick limb of the loop of Henle  
 c) Distal convoluted tubule  
**d) Collecting duct**

043. The drug competitively blocks chloride channels and prevents movement of sodium, potassium, and chloride into the renal tubular cells:  
**a) Furosemide (Lasix)**  
 b) Acetazolamide (Diamox)  
 c) Triamterene (Dyrenium)  
 d) Mannitol (Osmotrol)

044. The drug acts by affecting the tubular fluid composition in a non-receptor mediated fashion:  
 a) Furosemide (Lasix)  
 b) Acetazolamide (Diamox)  
 c) Triamterene (Dyrenium)  
**d) Mannitol (Osmotrol)**

045. The drug is a blood substitute having haemodynamical activity:  
**a) Polyglucinum**  
 b) Haemodesum  
 c) Sodium chloridum isotonic for injections  
 d) "Disolum", "Trisolum"

046. This drug is a desintoxicative plasma substitute:  
 a) Polyglucinum  
**b) Haemodesum**  
 c) Sodium chloridum isotonic for injections  
 d) "Disolum", "Trisolum"

047. This drug is a controller of water-salt and acid-basic state:  
 a) Polyglucinum  
 b) Haemodesum  
 c) Glucose isotonic for injections  
**d) "Disolum", "Trisolum"**

(6) *CHEMOTHERAPEUTIC DRUGS*

**PART I ANTIBIOTICS**

001. What does the term "antibiotics" mean:  
 a) Non-organic or synthetic substances that selectively kill or inhibit the growth of other microorganisms  
**b) Substances produced by some microorganisms and their synthetic analogues that selectively kill or inhibit the growth of another microorganisms**  
 c) Substances produced by some microorganisms and their synthetic analogues that inhibit the growth of organism cells  
 d) Synthetic analogues of natural substances that kill protozoa and helminthes

002. General principles of anti-infective therapy are:  
 a) Clinical judgment of microbiological factors  
 b) Definitive identification of a bacterial infection and the microorganism's susceptibility  
 c) Optimal route of administration, dose, dosing frequency and duration of treatment  
**d) All of the above**

003. Minimal duration of antibacterial treatment usually is:  
 a) Not less than 1 day  
**b) Not less than 5 days**  
 c) Not less than 10-14 days  
 d) Not less than 3 weeks

004. Rational anti-microbial combination is used to:  
 a) Provide synergism when microorganisms are not effectively eradicated with a single agent alone  
 b) Provide broad coverage  
 c) Prevent the emergence of resistance  
**d) All of the above**

005. Mechanisms of bacterial resistance to anti-microbial agents are the following, EXCEPT:

- Active transport out of a microorganism or/and hydrolysis of an agent via enzymes produced by a microorganism
- Enlarged uptake of the drug by a microorganism**
- Modification of a drug's target
- Reduced uptake by a microorganism

006. The statement, that some microorganisms can develop alternative metabolic pathways for rendering reactions inhibited by the drug, is:

- True**
- False

007. All of the following drugs are antibiotics, EXCEPT:

- Streptomycin
- Penicillin
- Co-trimoxazole**
- Chloramphenicol

008. Bactericidal effect is:

- Inhibition of bacterial cell division
- Inhibition of young bacterial cell growth
- Destroying of bacterial cells**
- Formation of bacterial L-form

009. Which of the following groups of antibiotics demonstrates a bactericidal effect?

- Tetracyclines
- Macrolides
- Penicillins**
- All of the above

010. Bacteriostatic effect is:

- Inhibition of bacterial cell division**
- Inhibition of young bacterial cells growth
- Destroying of bacterial cells
- Formation of bacterial L-form

011. Which of the following groups of antibiotics demonstrates a bacteriostatic effect:

- Carbapenems
- Macrolides**
- Aminoglycosides
- Cephalosporins

012. Which of the following antibiotics contains a beta-lactam ring in their chemical structure :

- Penicillins
- Cephalosporins
- Carbapenems and monobactams
- All groups**

013. Tick the drug belonging to antibiotics-macrolides:

- Neomycin
- Doxycycline
- Erythromycin**
- Cefotaxime

014. Tick the drug belonging to antibiotics-carbapenems:

- Aztreonam
- Amoxicillin
- Imipinem**
- Clarithromycin

015. Tick the drug belonging to antibiotics-monobactams:

- Ampicillin
- Bicillin-5
- Aztreonam**
- Imipinem

016. Tick the drug belongs to antibiotics-cephalosporins:

- Streptomycin
- Cefaclor**
- Phenoxymethilpenicillin
- Erythromycin

017. Tick the drug belonging to lincozamides:

- Erythromycin

**b) Lincomycin**  
 c) Azithromycin  
 d) Aztreonam

**018.** Tick the drug belonging to antibiotics-tetracyclines:  
**a) Doxycycline**  
 b) Streptomycin  
 c) Clarithromycin  
 d) Amoxacillin

**019.** All of antibiotics are aminoglycosides, EXCEPT:  
 a) Gentamycin  
 b) Streptomycin  
**c) Clindamycin**  
 d) Neomycin

**020.** Tick the drug belonging to nitrobenzene derivative:  
 a) Clindamycin  
 b) Streptomycin  
 c) Azithromycin  
**d) Chloramphenicol**

**021.** Tick the drug belonging to glycopeptides:  
**a) Vancomycin**  
 b) Lincomycin  
 c) Neomycin  
 d) Carbenicillin

**022.** Antibiotics inhibiting the bacterial cell wall synthesis are:  
**a) Beta-lactam antibiotics**  
 b) Tetracyclines  
 c) Aminoglycosides  
 d) Macrolides

**023.** Antibiotic inhibiting bacterial RNA synthesis is:  
 a) Erythromycin  
**b) Rifampin**  
 c) Chloramphenicol  
 d) Imipinem

**024.** Antibiotics altering permeability of cell membranes are:  
 a) Glycopeptides  
**b) Polymyxins**  
 c) Tetracyclines  
 d) Cephalosporins

**025.** All of the following antibiotics inhibit the protein synthesis in bacterial cells, EXCEPT:  
 a) Macrolides  
 b) Aminoglycosides  
**c) Glycopeptides**  
 d) Tetracyclines

**026.** Biosynthetic penicillins are effective against:  
**a) Gram-positive and gram-negative cocci, Corynebacterium diphtheria, spirochetes, Clostridium gangrene**  
 b) Corynebacterium diphtheria, mycobacteria  
 c) Gram positive cocci, viruses  
 d) Gram negative cocci, Rickettsia, mycotic infections

**027.** Which of the following drugs is a gastric acid resistant:  
 a) Penicillin G  
**b) Penicillin V**  
 c) Carbenicillin  
 d) Procain penicillin

**028.** Which of the following drugs is penicillinase resistant:  
**a) Oxacillin**  
 b) Amoxacillin  
 c) Bicillin-5  
 d) Penicillin G

**029.** All of the following drugs demonstrate a prolonged effect, EXCEPT:  
**a) Penicillin G**  
 b) Procain penicillin

c) Bicillin-1  
d) Bicillin-5

030. Mechanism of penicillins' antibacterial effect is:  
**a) Inhibition of transpeptidation in the bacterial cell wall**  
 b) Inhibition of beta-lactamase in the bacterial cell  
 c) Activation of endogenous proteases, that destroy bacterial cell wall  
 d) Activation of endogenous phospholipases, which leads to alteration of cell membrane permeability

031. Pick out the beta-lactamase inhibitor for co-administration with penicillins:  
 a) Clavulanic acid  
 b) Sulbactam  
 c) Tazobactam  
**d) All of the above**

032. Cephalosporines are drugs of choice for treatment of:  
 a) Gram-positive microorganism infections  
 b) Gram-negative microorganism infections  
**c) Gram-negative and gram-positive microorganism infections, if penicillins have no effect**  
 d) Only bacteroide infections

033. Carbapenems are effective against:  
 a) Gram-positive microorganisms  
 b) Gram-negative microorganisms  
 c) Only bacteroide infections  
**d) Broad-spectrum**

034. All of the following antibiotics are macrolides, EXCEPT:  
 a) Erythromycin  
 b) Clarithromycin  
**c) Lincomycin**  
 d) Roxithromycin

035. Tetracyclines have following unwanted effects:  
 a) Irritation of gastrointestinal mucosa, phototoxicity  
 b) Hepatotoxicity, anti-anabolic effect  
 c) Dental hypoplasia, bone deformities  
**d) All of the above**

036. Tick the drug belonging to antibiotics-aminoglycosides:  
 a) Erythromycin  
**b) Gentamycin**  
 c) Vancomycin  
 d) Polymyxin

037. Aminoglycosides are effective against:  
 a) Gram positive microorganisms, anaerobic microorganisms, spirochetes  
 b) Broad-spectrum, except *Pseudomonas aeruginosa*  
 c) Gram negative microorganisms, anaerobic microorganisms  
**d) Broad-spectrum, except anaerobic microorganisms and viruses**

038. Aminoglycosides have the following unwanted effects:  
 a) Pancytopenia  
 b) Hepatotoxicity  
**c) Ototoxicity, nephrotoxicity**  
 d) Irritation of gastrointestinal mucosa

039. Choose the characteristics of chloramphenicol:  
**a) Broad-spectrum. Demonstrates a bactericidal effect.**  
 b) Influences the Gram-positive microorganisms. Demonstrates a bactericidal effect.  
 c) Influences the Gram-negative microorganisms. Demonstrates a bactericidal effect.  
 d) Broad-spectrum. Demonstrates a bacteriostatic effect.

040. Chloramphenicol has the following unwanted effects:  
 a) Nephrotoxicity  
**b) Pancytopenia**  
 c) Hepatotoxicity  
 d) Ototoxicity

041. Choose the characteristics of lincozamides:  
 a) Broad-spectrum. Demonstrates a bactericidal effect.  
 b) Influence mainly the anaerobic organisms, Gram negative cocci.  
 c) Broad-spectrum. Demonstrates a bacteriostatic effect.

**d) Influence mainly the anaerobic organisms, Gram positive cocci.**

042. Lincozamides have the following unwanted effect:

- Nephrotoxicity
- Cancerogenity
- Pseudomembranous colitis**
- Irritation of respiratory organs

043. Choose the characteristics of vancomycin:

- It is a glycopeptide, inhibits cell wall synthesis active only against Gram-negative bacteria
- It is a glycopeptide, that alters permeability of cell membrane and is active against anaerobic bacteria
- It is a beta-lactam antibiotic, inhibits cell wall synthesis active only against *Pseudomonas aeruginosa*
- It is a glycopeptide, inhibits cell wall synthesis and is active only against Gram-positive bacteria.**

044. Vancomycin has the following unwanted effects:

- Pseudomembranous colitis
- Hepatotoxicity
- "Red neck" syndrome, phlebitis**
- All of the above

045. Which of the following drugs is used for systemic and deep mycotic infections treatment:

- Co-trimoxazol
- Griseofulvin
- Amphotericin B**
- Nitrofugin

046. Which of the following drugs is used for dermatomycosis treatment:

- Nystatin
- Griseofulvin**
- Amphotericin B
- Vancomycin

047. Which of the following drugs is used for candidiasis treatment:

- Griseofulvin
- Nitrofugin
- Myconazol**
- Streptomycin

048. All of the following antifungal drugs are antibiotics, EXCEPT:

- Amphotericin B
- Nystatin
- Myconazol**
- Griseofulvin

049. Mechanism of Amphotericin B action is:

- Inhibition of cell wall synthesis
- Inhibition of fungal protein synthesis
- Inhibition of DNA synthesis
- Alteration of cell membrane permeability**

050. Azoles have an antifungal effect because of:

- Inhibition of cell wall synthesis
- Inhibition of fungal protein synthesis
- Reduction of ergosterol synthesis**
- Inhibition of DNA synthesis

051. Which of the following drugs alters permeability of *Candida* cell membranes:

- Amphotericin B
- Ketoconazole
- Nystatin**
- Terbinafine

052. Amfotericin B has the following unwanted effects:

- Psychosis
- Renal impairment, anemia**
- Hypertension, cardiac arrhythmia
- Bone marrow toxicity

053. Tick the drug belonging to antibiotics having a polyene structure:

- Nystatin**
- Ketoconazole
- Griseofulvin
- All of the above

054. All of the following drugs demonstrate a fungicidal effect, EXCEPT:

- a) Terbinafin
- b) Amfotericin B**
- c) Ketoconazole
- d) Myconazol

055. Characteristics of polyenes are following, except:

- a) Alter the structure and functions of cell membranes
- b) Broad-spectrum
- c) Fungicidal effect**
- d) Nephrotoxicity, hepatotoxicity

056. Characteristics of Amfotericin B are following, EXCEPT:

- a) Used for systemic mycosis treatment
- b) Poor absorption from the gastro-intestinal tract
- c) Does not demonstrate nephrotoxicity**
- d) Influences the permeability of fungus cell membrane

## **PART II SYNTHETIC ANTIBACTERIAL DRUGS**

001. Sulfonamides are effective against:

- a) Bacteria and Chlamidia
- b) Actinomycetes
- c) Protozoa
- d) All of the above**

002. Mechanism of sulfonamides' antibacterial effect is:

- a) Inhibition of dihydropteroate reductase
- b) Inhibition of dihydropteroate synthase**
- c) Inhibition of cyclooxygenase
- d) Activation of DNA gyrase

003. Combination of sulfonamides with trimethoprim:

- a) Decreases the unwanted effects of sulfonamides
- b) Increases the antimicrobial activity**
- c) Decreases the antimicrobial activity
- d) Increases the elimination of sulfonamides

004. Sulfonamide potency is decreased in case of co-administration with:

- a) Oral hypoglycemic agents
- b) Local anesthetics – derivatives of paraaminobenzoic acid**
- c) Local anesthetics – derivatives of benzoic acid
- d) Non-narcotic analgesics

005. The following measures are necessary for prevention of sulfonamide precipitation and crystalluria:

- a) Taking of drinks with acid pH
- b) Taking of drinks with alkaline pH**
- c) Taking of saline drinks
- d) Restriction of drinking

006. Resorptive sulfonamides have the following unwanted effects on blood system:

- a) Hemolytic anemia
- b) Thrombocytopenia
- c) Granulocytopenia
- d) All of the above**

007. Mechanism of Trimethoprim' action is:

- a) Inhibition of cyclooxygenase
- b) Inhibition of dihydropteroate reductase**
- c) Inhibition of dihydropteroate synthase
- d) Inhibition of DNA gyrase

008. Sulfonamides have the following unwanted effects:

- a) Hematopoietic disturbances
- b) Crystalluria
- c) Nausea, vomiting and diarrhea
- d) All of the above**

009. Tick the drug, which is effective against mycobacteria only:

- a) Isoniazid**
- b) Streptomycin
- c) Rifampin

d) Kanamycin

**010.** Tick the antimycobacterial drug belonging to first-line agents:

- PAS
- Isoniazid**
- Kanamycin
- Pyrazinamide

**011.** Tick the antimycobacterial drug, belonging to second-line agents:

- Isoniazid
- PAS**
- Rifampin
- Streptomycin

**012.** Tick the antimycobacterial drug, belonging to antibiotics:

- Isoniazid
- PAS
- Ethambutol
- Rifampin**

**013.** Tick the antimycobacterial drug – hydrazide of isonicotinic acid:

- Rifampin
- Isoniazid**
- Ethambutol
- Pyrazinamide

**014.** Mechanism of Isoniazid action is:

- Inhibition of protein synthesis
- Inhibition of mycolic acids synthesis**
- Inhibition of RNA synthesis
- Inhibition of ADP synthesis

**015.** Mechanism of Rifampin action is:

- Inhibition of mycolic acids synthesis
- Inhibition of DNA dependent RNA polymerase**
- Inhibition of topoisomerase II
- Inhibition of cAMP synthesis

**016.** Mechanism of Cycloserine action is:

- Inhibition of mycolic acids synthesis
- Inhibition of RNA synthesis
- Inhibition of cell wall synthesis**
- Inhibition of pyridoxalphosphate synthesis

**017.** Mechanism of Streptomycin action is:

- Inhibition of cell wall synthesis
- Inhibition of protein synthesis**
- Inhibition of RNA and DNA synthesis
- Inhibition of cell membranes permeability

**018.** Rifampin has the following unwanted effect:

- Dizziness, headache
- Loss of hair
- Flu-like syndrome, tubular necrosis**
- Hepatotoxicity

**019.** Isoniazid has following unwanted effect:

- Cardiotoxicity
- Hepatotoxicity, peripheral neuropathy**
- Loss of hair
- Immunotoxicity

**020.** Ethambutol has the following unwanted effect:

- Cardiotoxicity
- Immunotoxicity
- Retrobulbar neuritis with red-green color blindness**
- Hepatotoxicity

**021.** Streptomycin has the following unwanted effect:

- Cardiotoxicity
- Hepatotoxicity
- Retrobulbar neuritis with red-green color blindness
- Ototoxicity, nephrotoxicity**

022. Mechanism of aminosalicylic acid action is:

- a) Inhibition of mycolic acids synthesis
- b) Inhibition of folate synthesis**
- c) Inhibition of DNA dependent RNA polymerase
- d) Inhibition of DNA gyrase

023. All of the following agents are the first-line antimycobacterial drugs, EXCEPT:

- a) Rifampin
- b) Pyrazinamide**
- c) Isoniazid
- d) Streptomycin

024. All of the following antimycobacterial drugs have a bactericidal effect, EXCEPT:

- a) Pyrazinamide**
- b) Streptomycin
- c) Rifampin
- d) Isoniazid

025. Combined chemotherapy of tuberculosis is used to:

- a) Decrease mycobacterium drug-resistance**
- b) Increase mycobacterium drug-resistance
- c) Decrease the antimicrobial activity
- d) Decrease the onset of antimycobacterial drugs biotransformation:

026. Tick the antibacterial drug – a nitrofurane derivative:

- a) Nitrofurantoin**
- b) Trimethoprim
- c) Ciprofloxacin
- d) Nystatin

027. Tick the antibacterial drug – a nitroimidazole derivative:

- a) Clavulanic acid
- b) Metronidazole**
- c) Nitrofurantoin
- d) Doxycycline

028. Tick the antibacterial drug – a quinolone derivative:

- a) Nitrofurantoin
- b) Nalidixic acid**
- c) Streptomycin
- d) Metronidazole

029. Tick the antibacterial drug – a fluoroquinolone derivative:

- a) Chloramphenicol
- b) Nitrofurantoin
- c) Nalidixic acid
- d) Ciprofloxacin**

030. Tick the indications for nitrofuranes:

- a) Infections of respiratory tract
- b) Infections of urinary and gastro-intestinal tracts**
- c) Syphilis
- d) Tuberculosis

031. Tick the unwanted effects of nitrofuranes:

- a) Nausea, vomiting
- b) Allergic reactions
- c) Hemolytic anemia
- d) All of the above**

032. Tick the indications for Metronidazole:

- a) Intra-abdominal infections, vaginitis, enterocolitis**
- b) Pneumonia
- c) As a disinfectant
- d) Influenza

033. Tick the unwanted effects of Metronidazole:

- a) Nausea, vomiting, diarrhea, stomatitis**
- b) Hypertension
- c) Disturbances of peripheral blood circulation
- d) All of the above

034. The mechanism of fluoroquinolones' action is:

- a) Inhibition of phospholipase C
- b) Inhibition of DNA gyrase**
- c) Inhibition of bacterial cell synthesis
- d) Alteration of cell membrane permeability

035. Fluoroquinolones are active against:

- a) Gram negative microorganisms only
- b) Mycoplasmas and Chlamidiae only
- c) Gram positive microorganisms only
- d) Variety of Gram-negative and positive microorganisms, including Mycoplasmas and Chlamidiae**

036. Tick the unwanted effects of fluoroquinolones:

- a) Hallucinations
- b) Headache, dizziness, insomnia**
- c) Hypertension
- d) Immunotoxicity

037. Tick the indications for fluoroquinolones:

- a) Infections of the urinary tract
- b) Bacterial diarrhea
- c) Infections of the urinary and respiratory tract, bacterial diarrhea**
- d) Respiratory tract infections

038. The drug of choice for syphilis treatment is:

- a) Gentamycin
- b) Penicillin**
- c) Chloramphenicol
- d) Doxycycline

### **PART III ANTIprotozoal AND ANTHELMINTIC DRUGS**

001. Tick the drug used for malaria chemoprophylaxis and treatment:

- a) Chloroquine**
- b) Quinidine
- c) Quinine
- d) Sulfonamides

002. Tick the drug used for amoebiasis treatment:

- a) Nitrofurantoin
- b) Iodoquinol**
- c) Pyrazinamide
- d) Mefloquine

003. Tick the drug used for trichomoniasis treatment:

- a) Metronidazole**
- b) Suramin
- c) Pyrimethamine
- d) Tetracycline

004. Tick the drug used for toxoplasmosis treatment:

- a) Chloroquine
- b) Tetracycline
- c) Suramin
- d) Pyrimethamine**

005. Tick the drug used for balantidiasis treatment::

- a) Azitromycin
- b) Tetracycline**
- c) Quinine
- d) Trimethoprim

006. Tick the drug used for leishmaniasis treatment:

- a) Pyrimethamine
- b) Albendazole
- c) Sodium stibogluconate**
- d) Tinidazole

007. Tick the antimalarial drug belonging to 8-aminoquinoline derivatives:

- a) Doxycycline
- b) Quinidine
- c) Primaquine**
- d) Chloroquine

008. All of the following antimalarial drugs are 4-quinoline derivatives, EXCEPT:

- a) Chloroquine
- b) Mefloquine
- c) Primaquine**
- d) Amodiaquine

009. Tick the antimalarial drug belonging to pyrimidine derivatives:

- a) Mefloquine
- b) Pyrimethamine**
- c) Quinidine
- d) Chloroquine

010. Tick the drug used for trypanosomosis treatment:

- a) Melarsoprol**
- b) Metronidazole
- c) Tetracyclin
- d) Quinidine

011. Tick the antimalarial drug having a gametocidal effect:

- a) Mefloquine
- b) Primaquine**
- c) Doxycycline
- d) Sulfonamides

012. All of the following antimalarial drugs influence blood schizonts, EXCEPT:

- a) Mefloquine
- b) Chloroquine
- c) Primaquine**
- d) Quinidine

013. Tick the antimalarial drug influencing tissue schizonts:

- a) Mefloquine
- b) Chloroquine
- c) Quinidine
- d) Primaquine**

014. Tick the group of antibiotics having an antimalarial effect:

- a) Aminoglycosides
- b) Tetracyclins**
- c) Carbapenems
- d) Penicillins

015. Tick the amebicide drug for the treatment of an asymptomatic intestinal form of amebiasis:

- a) Chloroquine
- b) Diloxanide**
- c) Emetine
- d) Doxycycline

016. Tick the drugs for the treatment of an intestinal form of amebiasis:

- a) Metronidazole and diloxanide**
- b) Diloxanide and streptomycin
- c) Diloxanide and Iodoquinol
- d) Emetine and metronidazole

017. Tick the drug for the treatment of a hepatic form of amebiasis:

- a) Diloxanide or Iodoquinol
- b) Tetracycline or doxycycline
- c) Metronidazole or emetine**
- d) Erythromycin or azitromycin

018. Tick the luminal amebicide drug:

- a) Metronidazole
- b) Emetine
- c) Doxycycline
- d) Diloxanide**

019. Tick the drug of choice for the treatment of extraluminal amebiasis:

- a) Iodoquinol
- b) Metronidazole**
- c) Diloxanide
- d) Tetracycline

020. Tick the drug, blocking acetylcholine transmission at the myoneural junction of helminthes:

- a) Levamisole
- b) Mebendazole
- c) Piperazine**
- d) Niclosamide

021. Tick niclosamide mechanism of action:

- a) Increasing cell membrane permeability for calcium, resulting in paralysis, dislodgement and death of helminthes
- b) Blocking acetylcholine transmission at the myoneural junction and paralysis of helminthes
- c) Inhibiting microtubule synthesis in helminthes and irreversible impairment of glucose uptake
- d) Inhibiting oxidative phosphorylation in some species of helminthes**

022. Tick praziquantel mechanism of action:

- a) Blocking acetylcholine transmission at the myoneural junction and paralysis of helminthes
- b) Inhibiting microtubule synthesis in helminthes and irreversible impairment of glucose uptake
- c) Increasing cell membrane permeability for calcium, resulting in paralysis, dislodgement and death of helminthes**
- d) Inhibiting oxidative phosphorylation in some species of helminthes

023. Tick piperazine mechanism of action:

- a) Inhibiting microtubule synthesis in helminthes and irreversible impairment of glucose uptake
- b) Blocking acetylcholine transmission at the myoneural junction and paralysis of helminthes**
- c) Inhibiting oxidative phosphorylation in some species of helminthes
- d) Increasing cell membrane permeability for calcium, resulting in paralysis, dislodgement and death of helminthes

024. Tick the drug, a salicylamide derivative:

- a) Praziquantel
- b) Piperazine
- c) Mebendazole
- d) Niclosamide**

025. Tick mebendazole mechanism of action:

- a) Inhibiting oxidative phosphorylation in some species of helminthes
- b) Increasing cell membrane permeability for calcium, resulting in paralysis, dislodgement and death of helminthes
- c) Inhibiting microtubule synthesis in helminthes and irreversible impairment of glucose uptake**
- d) Blocking acetylcholine transmission at the myoneural junction and paralysis of helminthes

026. Tick the drug, inhibiting oxidative phosphorylation in some species of helminthes:

- a) Niclosamide**
- b) Piperazine
- c) Praziquantel
- d) Mebendazole

027. Tick the drug for neurocysticercosis treatment:

- a) Praziquantel**
- b) Pyrantel
- c) Piperazine
- d) Bithionol

028. Tick the drug for nematodosis (roundworm invasion) treatment:

- a) Niclosamide
- b) Praziquantel
- c) Bithionol
- d) Pyrantel**

029. Tick the drug for cestodosis (tapeworm invasion) treatment:

- a) Piperazine
- b) Praziquantel**
- c) Pyrantel
- d) Ivermectin

030. Tick the drug for trematodosis (fluke invasion) treatment:

- a) Bithionol**
- b) Ivermectin
- c) Pyrantel
- d) Metronidazole

031. Tick the drug, a benzimidazole derivative:

- a) Praziquantel
- b) Mebendazole**
- c) Suramin
- d) Pyrantel

032. Tick the broad spectrum drug for cestodosis, trematodosis and cysticercosis treatment:

- a) Piperazine
- b) Ivermectine
- c) Praziquantel**
- d) Pyrantel

033. Tick the drug for ascaridosis and enterobiosis treatment:

- a) Bithionol
- b) Pyrantel**
- c) Praziquantel
- d) Suramin

034. Tick the drug for strongiloidosis treatment:

- a) Niclosamide
- b) Praziquantel
- c) Bithionol
- d) Ivermectin**

035. Tick the drug for echinococcosis treatment:

- a) Suramin
- b) Mebendazole or Albendazole**
- c) Piperazine
- d) Iodoquinol

#### **PART IV ANTIVIRAL AGENTS. AGENTS FOR CHEMOTHERAPY OF CANCER**

001. All of the following antiviral drugs are the analogs of nucleosides, EXCEPT:

- a) Acyclovir
- b) Zidovudine
- c) Saquinavir**
- d) Didanosine

002. Tick the drug, a derivative of adamantane:

- a) Didanosine
- b) Rimantadine**
- c) Gancyclovir
- d) Foscarnet

003. Tick the drug, a derivative of pyrophosphate:

- a) Foscarnet**
- b) Zidovudine
- c) Vidarabine
- d) Acyclovir

004. Tick the drug, inhibiting viral DNA synthesis:

- a) Interferon
- b) Saquinavir
- c) Amantadine
- d) Acyclovir**

005. Tick the drug, inhibiting uncoating of the viral RNA:

- a) Vidarabine
- b) Rimantadine**
- c) Acyclovir
- d) Didanosine

006. Tick the drug, inhibiting viral reverse transcriptase:

- a) Zidovudine**
- b) Vidarabine
- c) Rimantadine
- d) Gancyclovir

007. Tick the drug, inhibiting viral proteases:

- a) Rimantadine
- b) Acyclovir
- c) Saquinavir**
- d) Zalcitabine

008. Tick the drug of choice for herpes and cytomegalovirus infection treatment:

- a) Saquinavir
- b) Interferon alfa
- c) Didanosine
- d) Acyclovir**

009. Tick the drug which belongs to nonnucleoside reverse transcriptase inhibitors:

- a) Zidovudine
- b) Vidarabine
- c) Nevirapine**
- d) Gancyclovir

010. All of the following antiviral drugs are antiretroviral agents, EXCEPT:

- a) Acyclovir**
- b) Zidovudine
- c) Zalcitabine
- d) Didanosine

011. Tick the drug used for influenza A prevention:

- a) Acyclovir
- b) Rimantadine**
- c) Saquinavir
- d) Foscarnet

012. Tick the drug used for HIV infection treatment, a derivative of nucleosides:

- a) Acyclovir
- b) Zidovudine**
- c) Gancyclovir
- d) Trifluridine

013. Tick the antiviral drug which belongs to endogenous proteins:

- a) Amantadine
- b) Saquinavir
- c) Interferon alfa**
- d) Pencyclovir

014. Tick the drug which belongs to nucleoside reverse transcriptase inhibitors:

- a) Didanosine**
- b) Gancyclovir
- c) Nevirapine
- d) Vidarabine

015. All of the following antiviral drugs are anti-influenza agents, EXCEPT:

- a) Acyclovir**
- b) Amantadine
- c) Interferons
- d) Rimantadine

016. Tick the unwanted effects of zidovudine:

- a) Hallucinations, dizziness
- b) Anemia, neutropenia, nausea, insomnia**
- c) Hypertension, vomiting
- d) Peripheral neuropathy

017. Tick the unwanted effects of intravenous acyclovir infusion:

- a) Renal insufficiency, tremors, delerium**
- b) Rash, diarrhea, nausea
- c) Neuropathy, abdominal pain
- d) Anemia, neutropenia, nausea, insomnia

018. Tick the drug that can induce peripheral neuropathy and oral ulceration:

- a) Acyclovire
- b) Zalcitabine**
- c) Zidovudine
- d) Saquinavir

019. Tick the unwanted effects of didanosine:

- a) Hallucinations, dizziness, insomnia
- b) Anemia, neutropenia, nausea
- c) Hypertension, vomiting, diarrhea
- d) Peripheral neuropathy, pancreatitis, diarrhea, hyperuricemia**

020. Tick the unwanted effects of indinavir:

- a) Hypotension, vomiting, dizziness
- b) Nephrolithiasis, nausea, hepatotoxicity**
- c) Peripheral neuropathy, pancreatitis, hyperuricemia
- d) Anemia, neutropenia, nausea

021. Tick the drug that can induce nausea, diarrhea, abdominal pain and rhinitis:

a) Acyclovire  
 b) Zalcitabine  
 c) Zidovudine  
**d) Saquinavir**

022. All of the following effects are disadvantages of anticancer drugs, EXCEPT:  
 a) Low selectivity to cancer cells  
 b) Depression of bone marrow  
**c) Depression of angiogenesis**  
 d) Depression of immune system

023. Rational combination of anticancer drugs is used to:  
**a) Provide synergism resulting from the use of anticancer drugs with different mechanisms combination**  
 b) Provide synergism resulting from the use of anticancer drugs with the same mechanisms combination  
 c) Provide stimulation of immune system  
 d) Provide stimulation of cell proliferation

024. Tick the anticancer alkylating drug, a derivative of chloroethylamine:  
 a) Methotrexate  
 b) Cisplatin  
**c) Cyclophosphamide**  
 d) Carmustine

025. Tick the anticancer alkylating drug, a derivative of ethylenimine:  
 a) Mercaptopurine  
**b) Thiotepa**  
 c) Chlorambucil  
 d) Procarbazine

026. Tick the group of hormonal drugs used for cancer treatment:  
 a) Mineralocorticoids and glucocorticoids  
**b) Glucocorticoids and gonadal hormones**  
 c) Gonadal hormones and somatotropin  
 d) Insulin

027. Tick the anticancer alkylating drug, a derivative of alkylsulfonate:  
 a) Fluorouracil  
 b) Carboplatin  
 c) Vinblastine  
**d) Busulfan**

028. Tick the anticancer drug of plant origin:  
 a) Dactinomycin  
**b) Vincristine**  
 c) Methotrexate  
 d) Procarbazine

029. Action mechanism of alkylating agents is:  
 a) Producing carbonium ions altering protein structure  
**b) Producing carbonium ions altering DNA structure**  
 c) Structural antagonism against purine and pyrimidine  
 d) Inhibition of DNA-dependent RNA synthesis

030. Tick the anticancer drug, a pyrimidine antagonist:  
**a) Fluorouracil**  
 b) Mercaptopurine  
 c) Thioguanine  
 d) Methotrexate

031. Methotrexate is:  
 a) A purine antagonist  
**b) A folic acid antagonist**  
 c) An antibiotic  
 d) An alkylating agent

032. Tick the antibiotic for cancer chemotherapy:  
 a) Cytarabine  
**b) Doxorubicin**  
 c) Gentamycin  
 d) Etoposide

033. Fluorouracil belongs to:  
 a) Antibiotics

**b) Antimetabolites**

- c) Plant alkaloids
- d) Bone marrow growth factor

**034.** Tick the action mechanism of anticancer drugs belonging to plant alkaloids:

- a) Inhibition of DNA-dependent RNA synthesis
- b) Cross-linking of DNA
- c) Mitotic arrest at a metaphase**
- d) Nonselective inhibition of aromatases

**035.** General contraindications for anticancer drugs are:

- a) Depression of bone marrow
- b) Acute infections
- c) Severe hepatic and/or renal insufficiency
- d) All of the above**

**036.** Action mechanism of methotrexate is:

- a) Inhibition of dihydrofolate reductase**
- b) Activation of cell differentiation
- c) Catabolic depletion of serum asparagine
- d) All of the above

**037.** Tick the anticancer drug belonging to inorganic metal complexes:

- a) Dacarbazine
- b) Cisplatin**
- c) Methotrexate
- d) Vincristine

**038.** Tick the indication for estrogens in oncological practice:

- a) Leukemia
- b) Cancer of prostate**
- c) Endometrial cancer
- d) Brain tumors

**039.** Enzyme drug used for acute leukemia treatment:

- a) Dihydrofolate reductase**
- b) Asparaginase
- c) Aromatase
- d) DNA gyrase

**040.** All of the following drugs are derivatives of nitrosoureas, EXCEPT:

- a) Carmustine
- b) Vincristine**
- c) Lomustine
- d) Semustine

**041.** Tick the group of drugs used as subsidiary medicines in cancer treatment:

- a) Cytoprotectors
- b) Bone marrow growth factors
- c) Antimetastatic agents
- d) All of the above**

**042.** Tick the estrogen inhibitor:

- a) Leuprolide
- b) Tamoxifen**
- c) Flutamide
- d) Anastrozole

**043.** Tick the antiandrogen drug:

- a) Flutamide**
- b) Aminoglutethimide
- c) Tamoxifen
- d) Testosterone

**044.** Tick the drug belonging to aromatase inhibitors:

- a) Octreotide
- b) Anastrozole**
- c) Flutamide
- d) Tamoxifen

**045.** Tick the drug belonging to gonadotropin-releasing hormone agonists:

- a) Leuprolide**
- b) Tamoxifen

- c) Flutamide
- d) Anastrozole