

1. What pharmacological effect of diazepam allows using it in the treatment of neuroses?

- a. Diuretic
- b. Antipyretic
- c. Antidepressant
- d. Analgesic
- e. Anxiolytic**

2. An elderly patient suffers from constipation caused by colon hypotonia. What drug should be prescribed?

- a. Castor oil
- b. Sodium sulfate
- c. Novocainamide (Procainamide)
- d. Bisacodyl**
- e. Atropine sulfate

3. What solution is used to determine the mass-volume fraction of ammonia in a solution?

- a. Sodium hydroxide solution
- b. Sulfuric acid solution
- c. Potassium permanganate solution
- d. Iodine solution
- e. Hydrochloric acid solution**

4. A patient with an acute myocardial infarction had been receiving heparin as a component of complex therapy. After a time, the patient developed hematuria. What drug is indicated as an antidote to heparin?

- a. Protamine sulfate**
- b. Fibrinogen
- c. Neodicoumarin (ethyl biscoumacetate)
- d. Aminocaproic acid
- e. Vicasol (Menadione)

5. Which one of the listed compounds belongs to conjugated dienes?

- a. CH<sub>2</sub>=CH-CH=CH-CH<sub>3</sub>**
- b. CH<sub>2</sub>=CH-C(CH<sub>3</sub>)<sub>2</sub>-CH=CH<sub>2</sub>
- c. CH<sub>2</sub>=CH-CH<sub>2</sub>-CH=CH<sub>2</sub>
- d. CH<sub>2</sub>=C=CH<sub>2</sub>
- e. CH<sub>2</sub>=C=CH-CH<sub>2</sub>-CH<sub>3</sub>

6. When harvesting herbal raw material of calendula and chamomile, their inflorescences are being collected. What type of inflorescence is it?

- a. Round capitulum
- b. Flat capitulum**
- c. Spike
- d. Umbel
- e. Corymb

7. Первінні та вторинні нітроалкани є таутомерними сполуками. Яка таутомерія характерна для них?

- a. Аміно-імінна
- b. Аци-нітротаутомерія**
- c. Лактам-лактимна
- d. Азольна
- e. Кето-енольна

8. What reaction occurs according to the free-radical (SR) mechanism?

- a. \$CH<sub>2</sub>=CH<sub>2</sub>+Cl<sub>2</sub>\$
- b. \$C\_2H\_6+Cl\_2\$**
- c. \$C\_6H\_6+Cl\_2\$
- d. \$CH\_3CH\_2OH+HCl\$

e. \$CH\_3-CH\_3+O\_2\$

9. The presence of antibodies to HIV has been established in the analyzed serum by means of enzyme-linked immunosorbent assay. What method or reaction must be used to confirm the diagnosis of AIDS?

- a. Immunofluorescence
- b. Immunoblotting**
- c. Biological method
- d. Virological method
- e. Bacteriological method

10. Thiocyanatometric titration method requires secondary standard solution of potassium thiocyanate that is standardized with standard solution of:

- a. Sulfuric acid
- b. Copper (II) nitrate
- c. Silver nitrate**
- d. Iron (II) sulfate
- e. Hydrochloric acid

11. The therapeutic properties of activated charcoal are due to its large specific surface area. Name the phenomenon, when gas absorption occurs only at the surface of a solid object:

- a. Desorption
- b. Recuperation
- c. Cohesion
- d. Adsorption**
- e. Adhesion

12. Яким методом здійснюють кількісне визначення вісмуту в препараті?

- a. Комплексонометрії**
- b. Перманганатометрії
- c. Аргентометрії
- d. Йодометрії
- e. Меркуриметрії

13. A child had been administered antidiphtheric serum. What resistance was formed in the child?

- a. Primary
- b. Active
- c. Physiological
- d. Passive**
- e. Pathologic

14. What indicator is used, when sodium carbonate is being quantified in the preparation by means of acid-base titration?

- a. Methylene blue
- b. Methyl orange**
- c. Diphenylamine
- d. Ferroin
- e. Murexide

15. According to Van't Hoff rule, when the temperature is raised by 10 degrees, the reaction rate increases by:

- a. 10 times
- b. Temperature does not affect reaction rate
- c. 1.5 times
- d. 2-4 times**
- e. 5 times

16. Isotonicity is one of the requirements for infusion solutions. What aqueous salt solution is used in clinical practice as an isotonic solution?

- a. 10% solution of NaCl
- b. 0.85-0.90% solution of NaCl**
- c. 0.9% solution of MgCl<sub>2</sub>
- d. 4.5-5.0% glucose solution
- e. 10% solution of CaCl<sub>2</sub>

17. There are certain patterns of chemical and biological processes occurring with the drug in the body. Reduced absorption of tetracycline when it is co-administered with antacids is an example of:

- a. Pharmacokinetic incompatibility**
- b. Functional antagonism
- c. Pharmaceutical incompatibility
- d. Pharmacodynamic incompatibility
- e. Synergism

18. What substance is used as an indicator in the back titration of an aqueous solution of acetic acid?

- a. Diphenylamine
- b. Eriochrome black T
- c. Murexide
- d. Phenolphthalein**
- e. Diphenylcarbazone

19. You are studying the silvery downy plant of Asteraceae family, which is rich with essential oils and bitters. Harvested are apical sprouts with panicle of small round flower heads. This plant is:

- a. Chamomilla recutita
- b. Calendula officinalis
- c. Arctium lappa
- d. Bidens tripartita
- e. Artemisia absinthium**

20. Microscopy of the smears obtained from the coating on the patient's tonsils was stained according to the Neisser technique. The staining revealed thin yellow bacilli with dark blue grains at their ends, arranged in the form of the Roman numeral V. What pathology can be suspected based on the results of microscopy?

- a. Measles
- b. Pertussis
- c. Diphtheria**
- d. Influenza
- e. Tuberculosis

21. How many stereoisomeric aldohexoses exist?

- a. 4
- b. 2
- c. 16**
- d. 8
- e. 6

22. Having examined the patient, the doctor made a diagnosis of tick-borne encephalitis. What is the route of transmission of this disease?

- a. Parenteral
- b. Vertical
- c. Fecal-oral
- d. Vector-borne**
- e. Airborne-droplet

23. In the process of creating vaccines, pathogens of infectious diseases are being attenuated. What is the essence of the attenuation process?

- a. Isolation of protective antigens from microbial cells
- b. Artificial reduction of virulent properties of pathogens**
- c. Inactivation of pathogens while preserving the antigenic structure of cells

- d. Reduction of immunogenicity of the pathogen
- e. Discovering antigenic determinants of the main antigens of the pathogen

24. What type of cardiac arrhythmia occurs as a result of simultaneous disruption of excitability and conduction functions?

- a. Atrioventricular block
- b. Extrasystole
- c. Respiratory arrhythmia
- d. Atrial fibrillation**
- e. Sinus tachycardia

25. A patient suffers from intense cough with production of viscous sputum. What drug can thin the sputum and facilitate expectoration?

- a. Codeine phosphate
- b. Acetylcysteine**
- c. Butamirate
- d. Glaucine
- e. Prenoxdiazine

26. What tissue can be characterized by permeable cells located within the root of the primary structure?

- a. Endodermis**
- b. Exodermis
- c. Mesodermis
- d. Pericycle
- e. Central axial cylinder

27. The mechanism of action of hormones depends on their chemical nature. What hormones can penetrate the membrane and bind with intracellular receptors?

- a. Catecholamines
- b. Insulin and glucagon
- c. Oxytocin and vasopressin
- d. Tropic hormones
- e. Steroid and thyroid hormones**

28. A study of the microbiological purity of tablet formulations is conducted on the production site. After cultivating samples on mannitol salt agar, golden-yellow colonies grow up. Microscopic examination of colonies establishes the presence of gram-positive bacteria of spherical shape, located in clusters; microorganisms has the ability to coagulate the plasma. The pure culture of which of the following bacteria is discovered?

- a. Pseudomonas aeruginosa
- b. Staphylococcus saprophyticus
- c. Staphylococcus aureus**
- d. Enterobacteriaceae
- e. Staphylococcus epidermidis

29. One hour after a child took polyvitamins in the dosage form of a syrup, the child developed a markedly itching urticaria-type rash all over the body. What type of allergic response can be characterized by this sign?

- a. Autoallergic
- b. Cytotoxic
- c. Anaphylactic**
- d. Immune complex
- e. Delayed-type hypersensitivity

30. Який механізм інгібіторної дії неостигміну (прозерину)?

- a. Ковалентне зв'язування поза активним центром фермента
- b. Конкуренція з ацетилхоліном за активний центр фермента**
- c. Денатурація фермента

- d. Ковалентне зв'язування з субстратом ферменту
- e. Окиснення іона заліза в активном у центрі фермента

31. A benzimidazole derivative, omeprazole, has been prescribed to a patient with a duodenal ulcer accompanied by an increased secretion of gastric juice. What is the mechanism of action of this drug?

- a. Stimulation of H<sub>2</sub>-histamine receptors
- b. Irreversible blockade of H<sup>+</sup>, K<sup>+</sup> -ATPase**
- c. Stimulation of H<sup>+</sup>, K<sup>+</sup> -ATPase
- d. Blockade of M1-cholinergic receptors
- e. Blockade of H<sub>2</sub>-histamine receptors

32. Etiological factors of infectious diseases can be infectious agents with diverse ultrastructure. Which of the following groups does not have cellular structure, protein synthesis, enzymatic and energy systems?

- a. Fungi
- b. Viruses**
- c. Protozoa
- d. Rickettsia
- e. Bacteria

33. Microscopy shows that basidia with basidiospores are formed on the hymenium. What division do these fungi belong to?

- a. Lichenophyta
- b. Zygomycota
- c. Ascomycota
- d. Basidiomycota**
- e. Chytridiomycota

34. The type of bacterial respiration is of great importance for the growth and reproduction of bacteria. Some species are unable to reproduce in the presence of oxygen and use sulfate respiration. What are these microorganisms called?

- a. Facultative anaerobes
- b. Obligate anaerobes**
- c. Microaerophiles
- d. Obligate aerobes
- e. Macroaerophiles

35. The main mechanism of ammonia neutralization in the body is the biosynthesis of urea. The cycle of urea synthesis begins with the formation of a certain high-energy compound. What high-energy compound is it?

- a. Arginine
- b. Carbamoyl phosphate**
- c. Citrulline
- d. Fumaric acid
- e. Argininosuccinate

36. Action of a number of drugs is based on the effect of competitive inhibition of enzyme activity. Name its characteristic feature.

- a. Inhibition degree does not depend on the substrate concentration
- b. Inhibitor forms strong covalent bonds with the active site of the enzyme
- c. Inhibitor has no effect on the enzyme's affinity for its substrate
- d. Inhibitor is a structural analogue of the substrate**
- e. Inhibitor is a structural analogue of the enzyme

37. Який спосіб титрування використовують, якщо до розчину досліджуваної речовини додають точно вимірюаний надлишок допоміжного титранта?

- a. Будь-яке титрування
- b. Пряме титрування
- c. Замісникове титрування

d. Неводне титрування

**e. Титрування за залишком**

38. Many serological reactions require strictly aseptic conditions. What method of sterilization is optimal for decontamination of laboratory glassware?

a. Pasteurization

**b. Dry heat**

c. Calcination

d. Filtration

e. Tyndallization

39. A 53-year-old person has been admitted into the gastroenterology department with complaints of dyspeptic disorders and melena. Objectively, the patient has splenomegaly, ascites, and dilated superficial veins of the anterior abdominal wall. What syndrome can be characterized by these signs?

a. Acholia

b. Cholemia

c. Suprahepatic jaundice

d. Arterial hypotension

**e. Portal hypertension**

40. Early-flowering rhizomatous ephemeroids include: *Tussilago farfara*, *Convallaria majalis*, and:

a. *Chamomilla recutita*

b. *Thymus serpyllum*

c. *Carum carvi*

d. *Allium cepa*

**e. Adonis vernalis**

41. What is the mechanism of action of beta-lactam antibiotics?

a. Inhibition of DNA gyrase

b. Disruption of DNA synthesis

c. Inhibition of cytoplasmic \\\ membrane synthesis

d. Inhibition of protein synthesis \\\ in ribosomes

e. Inhibition of cell wall synthesis

42. To obtain exotoxins of some microorganisms, these microorganisms are inoculated into liquid nutrient medium, where microbial cultivation occurs and toxins are produced. At a certain stage it is necessary to remove the microbial cells from the medium, that is, to separate the toxins from microbes. What method should be applied in this case?

a. Bacteria-excluding filters

b. Disinfectants (chloramine)

c. Boiling

d. Autoclaving

e. Ultraviolet irradiation

43. A doctor has prescribed a nonsteroidal anti-inflammatory drug to relieve inflammation and pain syndrome. Name this drug:

a. Diclofenac sodium

b. Fentanyl

c. Glibenclamide

d. Loratadine

e. Paracetamol

44. What has an effect on the coagulating action of the coagulant ion, according to the Schulze-Hardy rule?

a. Ionic size

b. Adsorbability

c. Hydration ability

d. Polarization

e. Ionic charge

45. What family of viruses has a unique reverse transcriptase enzyme?

- a. Retroviruses
- b. Flaviviruses
- c. Togaviruses
- d. Picornaviruses
- e. Reoviruses

46. A man has undergone a course of radiotherapy and chemotherapy. The drug complex included 5-fluorodeoxyuridine that is an inhibitor of thymidylate synthase. This drug blocks the synthesis of a certain substance. What substance is it?

- a. mRNA
- b. DNA
- c. tRNA
- d. rRNA
- e. Protein

47. Name the ability of high-molecular compounds to prevent precipitation of lyophobic sols and deposition of cholesterol plaques on the vessel walls:

- a. Colloid protection
- b. Coacervation
- c. Thixotropy
- d. Sedimentation
- e. Coagulation

48. The third analytical group of cations (acid-base classification) includes  $\text{Ca}^{2+}$ ,  $\text{Sr}^{2+}$ ,  $\text{Ba}^{2+}$ . What acid can function as a precipitating agent (group reagent) for these cations?

- a.  $\text{H}_2\text{SO}_4$
- b.  $\text{HNO}_3$
- c.  $\text{CH}_3\text{COOH}$
- d.  $\text{HCl}$
- e.  $\text{HClO}_4$

49. During bacteriology of the feces of a patient with diarrhea, a pure culture of rod-shaped, slightly bent microorganisms was isolated. In the microslide, these microorganisms resemble schools of fish. Their inoculation on alkaline media (alkaline peptone water) results in formation of a blue-tinted film after 6 hours. What pathogen has such properties?

- a. Spirochetes
- b. Escherichia coli
- c. Salmonellae
- d. Vibrio cholerae
- e. Mycobacteria

50. Rhizome of a species belonging to the Asteraceae family is polycephalous, succulent, has lysigenous cavities, accumulates inulin. Such underground organ is characteristic of:

- a. Helianthus annuus
- b. Digitalis grandiflora
- c. Inula helenium
- d. Sorbus aucuparia
- e. Hyoscyamus niger

51. До якого виду хроматографії відносять метод газорідинної хроматографії?

- a. Розподільної
- b. Гель-хроматографії
- c. Іоннобмінної
- d. Адсорбційної
- e. Афінної

52. The second stage of detoxification involves joining certain chemical compounds with functional groups of toxins. Select one such compound:

- a. Cholesterol
- b. Pyruvate
- c. Glucose
- d. Glucuronic acid
- e. Higher fatty acids

53. For the symptomatic treatment of diarrhea, the doctor prescribed the patient a drug that inhibits intestinal peristalsis after making sure that the patient's diarrhea was of non-infectious origin. What drug was prescribed in this case?

- a. Dexamethasone
- b. Mannitol
- c. Loperamide
- d. Augmentin (Co-amoxiclav)
- e. Thiamine

54. The bacterial culture obtained from a patient does not grow when exposed to oxygen. Conditions suitable for bacterial culture growth can be created in:

- a. Krotov apparatus
- b. Oxidative medium
- c. Pasteur oven
- d. Serum-supplemented medium
- e. Anaerobic culture jar

55. A patient demonstrates symmetrical dermatitis on the palms. A doctor made a diagnosis of pellagra. What vitamin deficiency can result in such symptoms?

- a. Nicotinic acid
- b. Folic acid
- c. Cobalamin
- d. Ascorbic acid
- e. Cholecalciferol

56. Which of the listed plants is a bush with imparipinnate leaves, decussate leaf arrangement, and juicy black fruits?

- a. Sambucus nigra
- b. Arctostaphylos uva-ursi
- c. Ledum palustre
- d. Urtica dioica
- e. Chelidonium majus

57. What drug should be prescribed to a patient with bronchospasm?

- a. Bisacodyl
- b. Salbutamol
- c. Insulin
- d. Vicasol (Menadione)
- e. Oxytocin

58. A woman, who works at a factory that produces phenylhydrazine, came to a hospital with complaints of general weakness, dizziness, and drowsiness. Her blood has signs of anemia with high levels of reticulocytosis, anisocytosis, and poikilocytosis; isolated normocytes are present in the woman's blood. What type of anemia is it?

- a. Iron-deficiency anemia
- b. Aplastic anemia
- c. Metaplastic anemia
- d. Protein-deficiency anemia
- e. Hemolytic anemia

59. An analytical chemist performs a qualitative analysis of cations that belong to the sixth analytical group. If nickel ions are processed with Chugaiev's reagent (dimethylglyoxime), a colored compound is produced. What is the color of the resulting compound?

- a. Violet
- b. Yellow
- c. Red
- d. Blue
- e. Green

60. What parameter takes into account the deviation of the properties of a real solution from an ideal one?

- a. Degree of dissociation
- b. Concentration
- c. Fugacity
- d. Activity
- e. Isotonic coefficient

61. In the roots of primary structure, the nutrient reserves are stored in the:

- a. Mesodermis
- b. Central axial cylinder
- c. Exodermis
- d. Pericycle
- e. Endodermis

62. In order to carry out the silver cations identification, HCl was added to the solution. Later, the formed solution was followed by adding the solution of ammonia. Specify which of the below-mentioned compounds are formed in such case?

- a. \$AgCl\$
- b. \$[Ag\_2(NH\_3)\_3]Cl\$
- c. \$[Ag(NH\_3)\_2]Cl\$
- d. AgOH
- e. \$[Ag(NH\_3)\_3]Cl\$

63. A human is immune to the plague of cattle and dogs. What type of immunity is it?

- a. Artificial passive
- b. Natural active
- c. Natural passive
- d. Innate
- e. Artificial active

64. A man came to a doctor complaining of a headache, pain in the throat during swallowing, and an increase in the body temperature. He was diagnosed with tonsillitis. What changes in the patient's blood can be expected in this case?

- a. Lymphocytosis
- b. Monocytosis
- c. Neutrophilic leukocytosis
- d. Basophilic leukocytosis
- e. Eosinophilic leukocytosis

65. Vitamins can enhance each other's effects, when taken simultaneously. What vitamin potentiates the activity of vitamin P?

- a. \$C\$
- b. \$B\_1\$
- c. \$B\_2\$
- d. D
- e. \$A\$

66. During harvesting of a herbal raw material (belladonna), the plants had burns and patches of withering and rot. What microorganisms cause this kind of damage in plants?

- a. Viroids
- b. Mycoplasma
- c. Viruses

- d. Protozoa
- e. Microfungi

67. During the assessment of air purity in an aseptic unit of a pharmacy, sedimentation analysis resulted in growth of small colonies with areas of hemolysis. What medium was used for inoculation in this case?

- a. Blood agar
- b. Egg-yolk salt agar
- c. Ploskirev agar
- d. Levine formulation (eosin methylene blue agar)
- e. Endo agar

68. To preserve valuable varietal qualities of peppermint, the optimal method of its propagation was chosen. What method is it?

- a. Plantlets
- b. Parts of the tuber
- c. Germinated seeds
- d. Leaf cuttings
- e. Parts of the rhizome

69. People, who were indoors during a fire, suffer from a carbon monoxide poisoning. What type of hypoxia is observed in such cases?

- a. Hemic hypoxia
- b. Circulatory hypoxia
- c. Hypoxic hypoxia
- d. Tissue hypoxia
- e. Respiratory hypoxia

70. What type of fruit is characteristic of *Atropa belladonna*?

- a. Hesperidium
- b. Capsule
- c. Berry
- d. Siliques
- e. Legume

71. Salts and esters of oxalic acid are called:

- a. Oxalates
- b. Adipinates
- c. Malonates
- d. Urates
- e. Succinates

72. What cation of the third analytical group can be precipitated using the group reagent  $H_2SO_4$  only in the presence of ethanol (binds water and concentrates the solution)?

- a.  $Ca^{2+}$
- b.  $K^+$
- c.  $Sr^{2+}$
- d.  $Na^+$
- e.  $Ba^{2+}$

73. Який із патогенетичних факторів відіграє провідну роль у розвитку набряків у пацієнтів після тривалого голодування?

- a. Зниження осмотичного тиску крові
- b. Зниження онкотичного тиску крові
- c. Підвищення осмотичного тиску інтерстиціальної рідини
- d. Зниження гідростатичного тиску крові
- e. Підвищення онкотичного тиску в тканинах

74. What can be used to distinguish formic acid from acetic acid?

- a. \$Br\_2(H\_2O)\$
- b. \$NaOH\$
- c. \$H\_2SO\_4\$
- d. \$[Ag(NH\_3)\_2]OH\$
- e. \$NaHCO\_3\$