

1. An analytical pharmacist uses iodometry to quantify a 0.02% nitrofurazone solution. What indicator is used for this purpose?

- A. Starch
- B. Potassium chromate
- C. Methyl red
- D. Phenolphthalein
- E. Crystal violet

2. An analytical pharmacist performs the express analysis of anti-inflammatory eye drops containing potassium iodide. What method is used for quantification of the active substance?

- A. Argentometry
- B. Complexometry
- C. Nitritometry
- D. Acidimetry
- E. Alkalimetry

3. Tosylchloramide sodium (chloramine) has a disinfecting effect due to the release of active chlorine in an acidic medium. What method is used to quantify it?

- A. Iodometry
- B. Nitritometry
- C. Complexometry
- D. Permanganatometry
- E. Iodochlorometry

4. A drug quality control laboratory performs certification of antibiotics. What antibiotic has  $\alpha$ -amino acid residue that can be determined using the ninhydrin reaction?

- A. Ampicillin
- B. Oxacillin
- C. Chloramphenicol
- D. Cefazolin
- E. Lincomycin

5. Alkalimetry is used to determine the quantitative content of diphenhydramine hydrochloride antihistamine. What solution is used as a titrant in this analysis?

- A. Sodium hydroxide solution
- B. Potassium bromate solution
- C. Sodium thiosulfate solution
- D. Potassium permanganate solution
- E. Hydrochloric acid solution

6. Pharmaceutical analysis of glutamic acid requires the determination of nitrogen after mineralization with concentrated sulfuric acid. Ammonia that forms during the test is pumped away into the receiving flask. What solution should the receiving flask contain during this test?

- A. Titrated hydrochloric acid solution
- B. Saturated sodium chloride solution
- C. Titrated sodium edetate solution
- D. Freshly prepared tannin solution
- E. Iodized potassium iodide solution

7. Nitrofurazone (Nitrofurazone, Furacillin) is a synthetic antibacterial agent. What parameter must be measured by an analytical pharmacist, when using the spectrophotometric method to quantify this agent?

- A. Optical density
- B. Melting point
- C. Angle of rotation
- D. Refractive index
- E. pH of the solution

8. An analytical pharmacist uses cerimetry for quantification of nifedipine. What indicator is used in this method?

- A. Ferroin
- B. Potassium chromate
- C. Phenolphthalein
- D. Tropeolin 00
- E. Methyl orange

9. A pharmacist at the analytical quality control laboratory uses acidimetry in a non-aqueous medium to study a verapamil hydrochloride substance. What solution would the pharmacist use as a titrant in this study?

- A. Perchloric acid solution
- B. Potassium bromate solution
- C. Sodium nitrite solution
- D. Sodium edetate solution
- E. Zinc sulfate solution

10. An analytical pharmacist analyzes the antianginal agent glyceryl trinitrate (nitroglycerin). What solution would the pharmacist use to identify the nitrate ions that form after hydrolysis?

- A. Diphenylamine solution
- B. Lanthanum(III) nitrate solution
- C. Thiourea solution
- D. Chloramine solution
- E. Glyoxal-hydroxyanil solution

11. Adrenaline contains two phenolic hydroxyls in its structure, which causes the chemical instability of the compound. What chemical process can occur during improper storage of this substance?

- A. Oxidation
- B. Reduction
- C. Polymerization
- D. Hydrolysis
- E. Weathering

12. An analytical pharmacist detects a primary aromatic amino group in the structure of benzocaine (anesthesine). What compound would the pharmacist use for identification?

- A. Azo dye
- B. Fluorescein
- C. Murexide
- D. Indophenol
- E. Iodoform

13. An analytical pharmacist uses a reaction with a sodium hydroxide solution during boiling to identify a nicotinamide substance. What gaseous product is released as a result of this reaction?

- A. Ammonia
- B. Carbon(IV) oxide
- C. Hydrogen sulfide
- D. Sulfur(VI) oxide
- E. Formaldehyde

14. A pharmaceutical factory produces antimicrobial agent nitrofurazone (Nitrofurazone, Furacilin). What initial substance is used in its synthesis?

- A. Furfural
- B. Benzaldehyde
- C. Hydroxyquinoline
- D. Resorcinol
- E. Aniline

15. Lipophilicity is very important for the bioavailability of a substance. Name the numerical parameter that characterizes lipophilicity.

- A. Distribution coefficient
- B. Stoichiometric coefficient
- C. Correction factor
- D. Coefficient of viscosity
- E. Coefficient of surface tension

16. During pharmaceutical analysis of a medicinal substance, its reaction with anti-pyrine (phenazone) was conducted in the presence of dilute hydrochloric acid. What compounds are present there, as indicated by the green coloring that appeared in the process of the analysis?

- A. Nitrites
- B. Sulfates
- C. Fluorides
- D. Bromides
- E. Iodides

17. An analytical pharmacist analyzes a cefazolin sodium substance. What solution is used for identification of sodium ions?

- A. Potassium pyroantimonate solution
- B. Sodium nitrite solution
- C. Barium chloride solution
- D. Ammonium oxalate solution
- E. Magnesium sulfate solution

18. An analytical pharmacist analyzes a chloramphenicol (levomycetin) substance and uses the specific absorption parameter value to calculate its quantitative content. What method was used for quantification in this case?

- A. Spectrophotometry
- B. Polarography
- C. Refractometry
- D. Photocolorimetry
- E. Polarimetry

19. *Sanguisorba officinalis* herbal raw material contains tannins. What method must be used to determine their content according to the State Pharmacopoeia of Ukraine?

- A. Permanganatometry
- B. Chromatography
- C. Photoelectrocolorimetry
- D. Nephelometry
- E. Spectrophotometry

20. The extraction process consists of several stages. What is the final stage of the extraction process?

- A. Mass transfer
- B. Maceration
- C. Dissolution
- D. Extraction of primary juice
- E. Washing the herbal raw material with an extractant

21. The structure of semi-synthetic penicillins (amoxicillin trihydrate, ampicillin sodium) contains a fragment of  $\alpha$ -amino acids. What reagent allows identification of this structural fragment?

- A. Ninhydrin
- B. Diphenylamine
- C. Formaldehyde
- D. Cyanogen bromide
- E. Aniline

22. Oxazepam is a benzodiazepine derivative. What method is used for its quantification?

- A. Acidimetry in a non-aqueous medium
- B. Reverse complexonometry
- C. Substitution alkalimetry
- D. Direct bromatometry
- E. Alkalimetry in an aqueous medium

23. An analytical pharmacist is testing a thiamine hydrobromide substance. What solution would the pharmacist use to determine sulfate impurities?

- A. Barium chloride solution
- B. Sodium nitrite solution
- C. Ammonium oxalate solution
- D. Sodium benzoate solution
- E. Calcium chloride solution

24. At a drug quality control laboratory, an analytical pharmacist uses thioacetamide reagent to test a procaine hydrochloride substance. What impurities are present in the substance, as indicated by the brown coloring that appears during the testing?

- A. Heavy metals
- B. Potassium
- C. Aluminum
- D. Magnesium
- E. Calcium

25. A pharmacist has prepared a tincture from *Adonis vernalis* grass. What special technique was necessary in this case to extract the active substances?

- A. They must be extracted in a neutral medium
- B. They must be extracted in a slightly alkaline medium
- C. They must be extracted in an alkaline medium
- D. They must be extracted in a weakly acidic medium
- E. They must be extracted in an acidic medium

26. A pharmacist has prepared a vaseline-based ointment. What substance must be introduced into the base that was heated to 40°C?

- A. Camphor
- B. Anesthesin
- C. Benzoic acid
- D. Streptocide (Sulfanilamide)
- E. Vinilin (polyvinyl butyl ether)

27. An analytical quality control laboratory performs analysis of an ascorbic acid substance. What device must be used to

determine its specific optical rotation?

- A. Polarimeter
- B. Spectrophotometer
- C. Refractometer
- D. Hydrometer
- E. Viscometer

28. Testing of a calcium lactate pentahydrate substance requires a reaction with a solution of thioglycolic acid in the presence of citric acid and an ammonia solution. What impurity can be detected using this reaction?

- A. Iron
- B. Potassium
- C. Chlorides
- D. Sulfates
- E. Ammonium salts

29. Alkalimetry in a non-aqueous medium method that is used to quantify a phenobarbital substance. What reagent is used as a solvent for this purpose?

- A. Dimethylformamide
- B. Glacial acetic acid
- C. Acetic anhydride
- D. Formic acid
- E. Ethyl alcohol

30. What is the shortest goods distribution channel for medical products?

- A. Zero-level
- B. Four-level
- C. Three-level
- D. Two-level
- E. One-level

31. A pharmacist needs to weigh out a medicinal substance from the general list — glucose. What minimum amount of glucose can be weighed out using one-gram hand scales?

- A. 0.02 g
- B. 0.01 g
- C. 0.03 g
- D. 0.04 g
- E. 0.05 g

32. A pharmacist needs to prepare a trituration of platyphylline hydrotartrate (1:10). What filler would be optimal for making this trituration?

- A. Lactose
- B. Refined sugar
- C. Corn starch
- D. Rice starch
- E. Mannitol

33. A pharmacist uses Vitepsol to prepare

rectal suppositories. What fluid should be used in this case to lubricate the suppository form?

- A. Spiritus saponatus
- B. Vaseline oil (liquid paraffin)
- C. Ethyl alcohol
- D. Purified water
- E. Peach oil

34. A pharmacist has prepared a solution for injections with an easily oxidized substance that requires stabilization with an antioxidant. Name this substance.

- A. Ascorbic acid
- B. Dimedrol (Diphenhydramine)
- C. Sodium chloride
- D. Urotropin
- E. Calcium gluconate

35. *Folia Uvae ursi* is a uroseptic agent. What is a permissible impurity in this herbal raw material?

- A. *Folia Vitis idaeae*
- B. *Folia Digitalis lanata*
- C. *Folia Cotini coggygriae*
- D. *Folia Urticae*
- E. *Herba Bursae pastoris*

36. An infusion and a liquid extract used as cardiotonics are obtained from *Crataegus oxyacantha* flowers and fruits. What active substance that is a component of this herbal raw material can be determined using spectrophotometry?

- A. Flavonoids
- B. Lipids
- C. Atropine
- D. Papaverine
- E. Cytisine

37. The method of preparing suspensions depends on the properties of the component substances. What substances have hydrophobic properties?

- A. Camphor, menthol
- B. Sodium bicarbonate, sodium sulfate
- C. Boric acid, calcium carbonate
- D. Zinc oxide, talcum
- E. Bolus alba (kaolin), bentonite

38. A pharmacy has received from its supplier a shipment of drugs that are included into the National Essential Drugs List. What is the pricing policy for these drugs?

- A. Controlled price
- B. Free-of-control price
- C. Fixed price
- D. Contract price
- E. Indicative price

39. *Digitalis purpurea* leaves are used to obtain cardiotoxic agents. At what temperature should this herbal raw material be dried?

- A. 50–60°C
- B. 30–40°C
- C. 80–90°C
- D. 20–25°C
- E. 90–100°C

40. A pharmacist needs to add a stabilizer to prepare an atropine sulfate solution for injections. What stabilizer would the pharmacist choose for this purpose?

- A. Hydrochloric acid
- B. Sodium hydroxide
- C. Sodium bicarbonate
- D. Sodium metabisulfite
- E. Ascorbic acid

41. The head manager of a pharmacy has decided to apply various management methods as a means of influencing separate employees and the staff as a whole. What management methods can be classified as psychosocial?

- A. Plan for improvement of the working conditions at the pharmaceutical facility
- B. Material stimuli that include salary rates, increments, bonuses, etc.
- C. The process of salary calculation for the sales department employees
- D. The process of distribution of the duties between the technical level managers
- E. —

42. *Achillea millefolium* grass is harvested during a certain stage of plant growth. What stage is it?

- A. During the mass flowering
- B. Before the flowering
- C. During the shoot growth
- D. During the fruiting
- E. During the budding

43. The phytochemical workshop of a factory produces extraction preparations. For what purpose are concentrated extracts used?

- A.** For quick preparation of infusions and decoctions in pharmacy practice  
**B.** To be used as ready-made medicines  
**C.** For preparation of tinctures  
**D.** For preparation of dry extracts  
**E.** For preparation of thick extracts
- 44.** Solutions of protected colloids are used in medical practice. What substance belongs to this group?
- A.** Protargol  
**B.** Basic bismuth nitrate  
**C.** Potassium iodide  
**D.** Camphor  
**E.** Sodium chloride
- 45.** *Thymus serpyllum* grass is harvested in Ukraine. At what stage of plant growth is this herbal raw material harvested?
- A.** During the flowering stage  
**B.** Before the flowering  
**C.** Before the formation of green fruits  
**D.** When the fruits are ripe  
**E.** After harvesting the fruits
- 46.** Gastroduodenopathies are one of the most common complications of pharmacotherapy during treatment with nonsteroidal anti-inflammatory drugs. What statement correctly describes the cause of their development?
- A.** Inhibition of prostaglandin synthesis in the mucosa  
**B.** Inhibition of lipid peroxidation  
**C.** Inhibition of neutrophil aggregation  
**D.** Disturbed pain impulse conduction  
**E.** Inhibition of platelet adhesion and aggregation
- 47.** Batches of several fatty oils were sent to the analytical quality control laboratory. One of the criteria for the study of fatty oils is determining their solubility. What oil is well soluble in ethyl alcohol?
- A.** Castor oil  
**B.** Cocoa butter  
**C.** Sunflower oil  
**D.** Flaxseed oil  
**E.** Olive oil
- 48.** What are the parts of aqueous lanolin?
- A.** 70 parts of anhydrous lanolin and 30 parts of water  
**B.** 90 parts of anhydrous lanolin and 10 parts of water  
**C.** 80 parts of anhydrous lanolin and 20 parts of water  
**D.** 50 parts of anhydrous lanolin and 50 parts of water  
**E.** 5 parts of anhydrous lanolin and 95 parts of water
- 49.** According to the State Pharmacopoeia of Ukraine, chemical identification of *Atropa belladonna* grass must be carried out using thin-layer chromatography. What substance is identified on a chromatographic plate after treatment with a reagent?
- A.** Hyoscyamine  
**B.** Vinblastine  
**C.** Rutin  
**D.** Gallic acid  
**E.** Arbutin
- 50.** *Cynara scolymus* herbal raw material is a source of drugs with antisclerotic, choleric, and hepatoprotective effect. What parts of the plant are harvested as a herbal raw material?
- A.** Leaves and flower heads  
**B.** Roots  
**C.** Grass  
**D.** Seeds  
**E.** Fruits
- 51.** The ampoule workshop of a factory produces a 5% oil-based solution of tocopherol acetate for injections. What filling technique should be used to fill the ampoules with this solution?
- A.** Syringe  
**B.** Vapor condensation  
**C.** Vacuum  
**D.** Syringe and vacuum  
**E.** Syringe and vapor condensation
- 52.** A drug quality control laboratory certifies hormone drugs. What reagent is used to determine the steroid cycle?
- A.** Concentrated sulfuric acid  
**B.** Dilute nitric acid  
**C.** Sodium nitrite solution  
**D.** Diphenylamine solution  
**E.** Magnesium sulfate solution
- 53.** A pharmacy as a business has its income and expenditure operations. What business transaction will result in an increase of the amount of stocked goods?

- A.** Goods receipt from a supplier  
**B.** Money transfer from a bank to the cash desk  
**C.** Debt recovery from a person accountable  
**D.** Issuing money to be accounted for  
**E.** Receipt of low-value and fast-wearing items
- 54.** Eradication therapy must be prescribed for a patient with peptic ulcer disease of the duodenum. What antisecretory agent must be included into the eradication therapy scheme?
- A.** Omeprazole  
**B.** Almagel  
**C.** Famotidine  
**D.** Ranitidine  
**E.** Phosphalugel (Aluminum phosphate)
- 55.** A woman with diabetes mellitus has developed hypoglycemia after an insulin overdose. What measures should be taken at the first signs of hypoglycemia?
- A.** Give the patient a sugar lump to eat and a cup of warm sweetened tea  
**B.** Make an insulin injection  
**C.** Make an intramuscular injection of caffeine  
**D.** Introduce a 0.1% adrenaline solution subcutaneously  
**E.** Give nitroglycerine sublingually
- 56.** A 36-year-old patient developed acute pyelonephritis. What antibacterial agents has a nephrotoxic effect?
- A.** Gentamicin  
**B.** Erythromycin  
**C.** Ampicillin  
**D.** Tetracycline  
**E.** Penicillin
- 57.** A manufacturer plans to sell its new medicine directly to the consumers through its own network of pharmacies. What type of distribution channel is it?
- A.** Direct distribution channel (zero channel)  
**B.** One-level distribution channel  
**C.** Three-level distribution channel  
**D.** Two-level distribution channel  
**E.** Four-level distribution channel
- 58.** A pharmaceutical factory produces suppositories with hydrophilic bases. What parameter must be measured in the process of standardization of such suppositories?
- A.** Dissolution time  
**B.** Dry residue  
**C.** Boiling point  
**D.** Resuspendability  
**E.** Mechanical strength
- 59.** A pharmaceutical factory uses maceration technique to produce tinctures. How long must herbal raw materials be steeped according to this technique?
- A.** 7 days  
**B.** 2 days  
**C.** 5 days  
**D.** 12 hours  
**E.** 24 hours
- 60.** A pharmaceutical factory produces ophthalmic drugs in dropper tubes. What method is used to sterilize them?
- A.** Gas sterilization  
**B.** Radiation sterilization  
**C.** Filtration  
**D.** Dry heat sterilization  
**E.** Autoclaving
- 61.** A pharmaceutical company lacks the manufacturing power to satisfy the demand for certain medicines. The company increased the price of these medicines and stopped advertising them. What type of marketing is it?
- A.** Demarketing  
**B.** Synchromarketing  
**C.** Remarketing  
**D.** Conversion marketing  
**E.** Stimulation marketing
- 62.** Profitability is one of the economic indicators of the pharmacy's commercial activity. How is it is calculated?
- A.** Ratio of the sum of profits to the sum of turnover of goods  $\cdot 100\%$   
**B.** Ratio of the sum of profits to the sum of expences  $\cdot 100\%$   
**C.** Ratio of the sum of profits to the total cost of fixed assets  $\cdot 100\%$   
**D.** Ratio of the sum of profits to the total cost price of the goods  $\cdot 100\%$   
**E.** —
- 63.** What is the drug of choice for treatment of arterial hypertension during pregnancy?
- A.**  $\alpha$ -methyldopa  
**B.** Furosemide  
**C.** Sodium nitroprusside  
**D.** Captopril  
**E.** Propranolol
- 64.** What group of antibiotics should be

prescribed to treat chlamydial infection?

- A. Macrolides
- B. Cephalosprins
- C. Penicillins
- D. Carbapenems
- E. Aminoglycosides

65. A patient diagnosed with ischemic heart disease and chronic circulatory failure had been taking for a long time one of the drugs listed below. He developed hypokalemia, which resulted in cardiac rhythm disturbance and muscle weakness. What drug has caused this complication as a side effect?

- A. Furosemide
- B. Nifedipine
- C. Lisinopril
- D. Propranolol
- E. Spironolactone

66. A pharmacist prepares a compound powder. What medicinal substance must be comminuted without adding an adjuvant liquid (alcohol or ether)?

- A. Zinc oxide
- B. Menthol
- C. Thymol
- D. Streptocide (Sulfanilamide)
- E. Camphor

67. What is the name of soft gelatin capsules with an elongated neck?

- A. Tubatines
- B. Microcapsules
- C. Spansules
- D. Medules
- E. Rectal capsules

68. General sedimentation reagents are used to identify alkaloids in an extract obtained from herbal raw materials. Select from the list one such reagent.

- A. Dragendorff reagent
- B. Marquis reagent
- C. Vitali-Morin reagent
- D. Froehde reagent
- E. Erdman reagent

69. A pharmaceutical factory produces syrups for taste-masking of medicines. What substance must be removed from such syrups to prevent jellification in the end product?

- A. Pectin
- B. Starch
- C. Sucrose
- D. Glucose
- E. Fructose

70. A woman at the third trimester of her pregnancy fell ill with pneumonia. A doctor prescribed her a fluoroquinolone. What negative effect can it have on the fetus?

- A. Chondrotoxic
- B. Hepatotoxic
- C. Nephrotoxic
- D. Neurotoxic
- E. Hematotoxic

71. What pharmacological group of drugs must not be combined with expectorants?

- A. Antitussive drugs
- B. Antibacterial drugs
- C. Mucolytic agents
- D. Polyvitamins
- E. Decongestants

72. *Rhamnus cathartica* fruits contain anthracene derivatives. What qualitative reaction is used to determine the presence of these substances in a herbal raw material?

- A. Reaction with an alkali
- B. Reaction with Molisch reagent
- C. Reaction with ammonium iron(III) sulfate
- D. Reaction with iron(II) sulfate
- E. Reaction with Fehling reagent

73. The head manager of a pharmacy flexibly uses the system of pharmacy management methods. What measure belongs to the methods of organizational influence?

- A. Clear distribution of tasks between the employees
- B. Material incentives (increments, bonuses)
- C. Satisfying the cultural and social needs of employees
- D. Promotion
- E. —

74. Analysis of sales volume of a certain drug shows that the drug is being manufactured in large batches and sales volume grows. However, the sales growth rate gradually slows down and the number of competitors increases. What stage of the product life cycle is it?

- A. Maturity
- B. Development
- C. Introduction
- D. Growth
- E. Decline

75. A patient with exertional angina pectoris had been taking isosorbide mononitrate orally for 2 months, when this drug lost its effectiveness. What is the likely cause of isosorbide mononitrate being no longer effective in this case?

- A. Tolerance
- B. Cumulation
- C. Sensitization
- D. Psychological dependence
- E. Physical dependence

76. The substances and their salts that can be used in manufacturing and purification of narcotic and psychotropic substances must be accounted at the pharmacy as:

- A. Precursors
- B. Toxic substances
- C. Potent substances
- D. Narcotic substances
- E. Psychotropic substances

77. What medicinal substance must fill only 2/3 of the vial before sterilization?

- A. Sodium bicarbonate
- B. Sodium chloride
- C. Hexamethylenetetramine
- D. Calcium chloride
- E. Euphyllin (Aminophylline)

78. A pharmacist at the pharmacy has received a promotion. What type of job rotation is it?

- A. Vertical
- B. Mixed
- C. Horizontal
- D. Combined
- E. —

79. What type of marketing should be used by a pharmaceutical company in a situation, when the demand for medicines declines?

- A. Remarketing
- B. Conversion marketing
- C. Stimulational marketing
- D. Evolving marketing
- E. Synchronmarketing

80. A large pharmaceutical company produces a homogeneous selection of medicinal products and sells them on the domestic market. What model of marketing service organization was chosen by this

company?

- A. Functional
- B. Product-oriented
- C. Regional
- D. Segment-oriented
- E. Market-oriented

81. When obtaining individual substances, the choice of an extractant is determined mainly by its:

- A. Selectivity towards active substances
- B. Price
- C. Pharmacological inertness
- D. Thermostability
- E. Anti-hydrolysis effect

82. A pharmacy visitor approached the pharmacist with complaints of constricting retrosternal pain that radiates under the left scapula. The pain occurred after physical exertion and lasts approximately 5 minutes already. What medicine should be recommended to this visitor to stop the pain attack?

- A. Nitroglycerin
- B. Drotaverine
- C. Bisoprolol
- D. Diclofenac sodium
- E. Captopril

83. A 10-year-old child was prescribed an antibiotic to treat pneumonia, after which the mother noticed deterioration of the child's hearing. What group of antibiotics could have caused such a complication?

- A. Aminoglycosides
- B. Penicillins
- C. Cephalosporins
- D. Macrolides
- E. Fluoroquinolones

84. Inulin improves digestion and has a positive effect on carbohydrate metabolism. What plant is used as a source of inulin?

- A. *Helianthus tuberosus*
- B. *Althaea officinalis*
- C. *Brassica juncea*
- D. *Hypericum maculatum*
- E. *Astragalus dasyanthus*

85. A pharmaceutical factory produces soft dosage forms. What soft dosage form melts at the body temperature?

- A. Liniment
- B. Ointment
- C. Gel
- D. Cream
- E. Paste

86. The marketing team of a pharmaceutical company has calculated the coefficient of elasticity of the demand for medical products, which is equal to 1. What type of elasticity of the demand is it?

- A. Unitary
- B. Elastic
- C. Inelastic
- D. Perfectly elastic
- E. Perfectly inelastic

87. A pharmaceutical company can use different types of marketing, depending on the demand for the medicinal products that it produces. What type of demand makes it advisable to implement demarketing?

- A. Excessive
- B. Absent
- C. Negative
- D. Declining
- E. Satisfied

88. A pharmaceutical company produces medicinal syrups. What substances ensure the microbial stability of this dosage form?

- A. Preservatives
- B. Thickeners
- C. Solubilizers
- D. Emulsifiers
- E. Pectin substances

89. What economic parameter characterizes the effectiveness of the pharmacy's commercial, financial, and manufacturing activity?

- A. Profitability
- B. Stock of goods
- C. Circulation of goods
- D. Work productivity
- E. Inventory turnover

90. A pharmacy visitor asked the pharmacist to recommend her an anthelmintic drug that would be effective against *Ascaris* roundworms. Select one such drug from the list.

- A. Piperazine
- B. Calcitonin
- C. Riboflavin
- D. Pyrazinamide
- E. Ribavirin

91. *Centaurium erythraea* grass increases

appetite and is a component of herbal teas for stomach. What active substance causes this effect of the herbal raw material?

- A. Iridoids
- B. Alkaloids
- C. Simple phenols
- D. Flavonoids
- E. Saponins

92. What quality indicator is subject to additional control during the production of eye drops in the form of suspensions?

- A. Particle size
- B. Moisture content
- C. Acid value and peroxide value
- D. Purification methods
- E. Dry residue

93. Name the type of suppositories that are made from aqueous suspensions and undergo deep freezing.

- A. Lyophilized
- B. Porous
- C. Hollow
- D. Multi-layered
- E. Dyed

94. Agar-agar is used as a detoxifying absorbent and the basis of a nutrient medium for growing microorganisms. What class of bioactive substances does it belong to?

- A. Polysaccharides
- B. Flavonoids
- C. Vitamins
- D. Iridoids
- E. Coumarins

95. *Polemonium caeruleum* rhizomes with roots are a source material for making expectorants. What group of substances causes this effect?

- A. Saponins
- B. Flavonoids
- C. Tannins
- D. Anthraquinones
- E. Vitamins

96. In what capacity is benzyl alcohol used as a component of solutions for parenteral administration?

- A. Antimicrobial preservative
- B. Antioxidant
- C. Buffer solution
- D. pH regulator
- E. Isotonicity regulator

97. What effect will anthracene derivatives have on the human body, if -OH-

groups are located in both benzene rings of anthraquinone?

- A. Laxative
- B. Diuretic
- C. Litholytic
- D. Sedative
- E. Choleric

98. During macroscopic analysis of rhizomes with roots, a pharmacist notes that rhizomes often have a cavity in their center. The color of the raw material is reddish-brown on the outside, while on section reddish-brown bark and orange-red wood are visible. The taste is sweet at first, but becomes slightly astringent and bitter later. What plant is the source of this herbal raw material?

- A. *Rubia tinctorum*
- B. *Mentha piperita*
- C. *Sambucus nigra*
- D. *Thymus serpyllum*
- E. *Melissa officinalis*

99. What type of loan does the pharmacy receive in the form of goods, and returns mainly in monetary form?

- A. Commercial loan
- B. Bank loan
- C. State loan
- D. Term loan
- E. Prolonged loan

100. What adjuvants are used in manufacturing of tablets to change their taste?

- A. Corrigents
- B. Fillers
- C. Antioxidants
- D. Leavening agents
- E. Thickeners

101. The personal qualities of the head of a pharmaceutical company are attractive to the subordinates who want to emulate their boss in everything. What form of power of the manager is observed in this situation?

- A. Referent power
- B. Coercive power
- C. Legitimate power
- D. Power based on fear
- E. —

102. After lifting a load, a man developed sharp lumbar pain that intensifies during movements and radiates into the left leg. The patient was diagnosed with lumbosacral radiculopathy. What drug can

be recommended in this case?

- A. Diclofenac sodium
- B. Drotaverine hydrochloride
- C. Cyanocobalamin
- D. Atropine sulfate
- E. Enterosgel

103. To work properly, a pharmacy needs sufficient staff. What job position belongs to the auxiliary staff of a pharmacy?

- A. Packer
- B. —
- C. Pharmacist
- D. Head of a department
- E. Accountant

104. A patient, who has been taking warfarin for a long time, was recommended to take acetylsalicylic acid because of hyperthermic syndrome. What complication can be caused by such a combination of medicines?

- A. Hemorrhages
- B. Thrombus formation
- C. Dysbacteriosis
- D. Hyperkalemia
- E. Hypokalemia

105. A 60-year-old patient diagnosed with ischemic heart disease developed bradycardia of 50/min. What drug will be contraindicated in this case?

- A. Propranolol
- B. Nitroglycerin
- C. Nifedipine
- D. Heparin
- E. Nitrosorbide (Isosorbide dinitrate)

106. What antibacterial drug is most effective against chronic gastritis associated with *Helicobacter pylori* infection?

- A. Clarithromycin
- B. Lincomycin
- C. Levomycetin (Chloramphenicol)
- D. Ceftriaxone
- E. Co-trimoxazole

107. Various groups of propellants are used in production of aerosols. What group does carbon dioxide  $CO_2$  belong to?

- A. Compressed gases
- B. Liquefied gases
- C. Rarefied gases
- D. Volatile gases
- E. Non-volatile gases

108. The head manager of a pharmacy, together with the heads of its departments, decided to expand the selection of

products on sale at this pharmacy by expanding the range of products for diabetic nutrition. What type of managerial decision is it?

- A. Collegial
- B. Personal
- C. Individual
- D. Received from a higher-level organization
- E. —

**109.** All business transactions at a pharmacy must be documented. What type of cash operation must be recorded with a receipt cash order?

- A. Revenue of the pharmacy
- B. Advance salary payments
- C. Salary payments
- D. Issuing cash sums to be accounted for
- E. Transfer of the revenue to the bank account

**110.** The pharmacy received the goods from the supplier. In the process of acceptance by the authorized person, a discrepancy in the number of medicines was discovered. What document does the authorized person need to issue?

- A. Act on established discrepancy in quantity and quality
- B. Register of medicinal products received by the subject of economic activity
- C. Contract of sale
- D. Product report
- E. Logbook of receipt of goods by group

**111.** To reduce business risks, a pharmaceutical company expands its business by entering new areas and industries that are unrelated to the drug manufacturing. Name this process.

- A. Diversification
- B. Integration
- C. Modernization
- D. Intensification
- E. Conglomeration

**112.** A 65-year-old patient diagnosed with ischemic heart disease was prescribed acetylsalicylic acid as an antiplatelet agent. What daily dose of this drug will have an antiplatelet effect?

- A. 100 mg
- B. 200 mg
- C. 300 mg
- D. 400 mg
- E. 500 mg

**113.** A doctor prescribed amoxicillin to a

patient to treat bronchitis. What mucolytic is synergistic with this antibiotic?

- A. Ambroxol
- B. Dextromethorphan
- C. Glaucine
- D. Euphylline (Theophylline)
- E. Codeine

**114.** A pharmacy makes medicines according to individual prescriptions. How often must the pharmacy staff change their working clothes?

- A. At least twice a week
- B. At least once a week
- C. At least twice a month
- D. At least once a month
- E. At least once per shift

**115.** The director of a pharmaceutical company is engaged in strategic planning. What is the final stage of this process?

- A. Strategy evaluation
- B. Formulation of the mission
- C. Choosing a strategy
- D. Implementation of the strategic plan
- E. Evaluation and analysis of the external environment

**116.** The manager of a pharmacy chain has drawn up a document, in which he asks a pharmaceutical factory to provide him with the information about the assortment of ointments manufactured by this factory. What document was drawn up by the manager?

- A. Request
- B. Complaint
- C. Offer
- D. Contract
- E. Statement

**117.** The essential oil of which plant contains zamazali, which is formed during steam distillation from matricin?

- A. *Chamomila recutita*
- B. *Arnica montana*
- C. *Valeriana officinalis*
- D. *Melissa officinalis*
- E. *Inula helenium*

**118.** What method is used to sterilize the eye drops containing benzylpenicillin sodium salt?

- A. Not subject to sterilization
- B. Hot air
- C. Steam under pressure
- D. Flowing steam
- E. Ultraviolet radiation

**119.** What preservative did the pharmacist use to ensure the stability of eye drops?

- A. Boric acid
- B. Hydrochloric acid
- C. Sodium chloride
- D. Polyvinyl alcohol
- E. Methyl cellulose

**120.** Which one of the listed solutions for injections must be stabilized with a 0.1 mol-eq/L solution of hydrochloric acid?

- A. Novocaine (Procaine)
- B. Ascorbic acid
- C. Sodium bicarbonate
- D. Sodium thiosulfate
- E. Caffeine and sodium benzoate

**121.** What is the name of the settlement document printed by the registrar of settlement operations, when making settlements for the goods sold or services provided?

- A. Cash register fiscal receipt
- B. Settlement receipt
- C. Sales receipt
- D. Receipt
- E. Invoice

**122.** The pharmaceutical company directs all the efforts to the restoration of the range of endangered medicinal plants listed in the Red Book of Ukraine. What type of responsibility does the firm take on?

- A. Social
- B. Administrative
- C. Legal
- D. Criminal
- E. Personal

**123.** Which of the following pricing factors of a manufacturing pharmaceutical enterprise is internal?

- A. Expenses
- B. Consumers
- C. Participants in sales channels
- D. State regulation of prices
- E. Competitors

**124.** A pharmaceutical wholesaler sells ointment bases (vaseline, lanolin, etc.) in bulk ("an gross") to the pharmacies that make extemporaneous compounds. What sales method (type of distribution) is typical for selling these goods?

- A. Selective method
- B. Mass sales method
- C. Intensive method
- D. Integrated method
- E. —

**125.** What department of a pharmaceutical wholesaler analyzes the demand for medicines and implements measures to stimulate their sales?

- A. Marketing
- B. Storage
- C. Procurement
- D. Transport
- E. Automated accounting

**126.** The procedure for circulation of narcotic drugs, psychotropic substances, and precursors in pharmacies is regulated by law. Which one of the medicines listed below is a narcotic drug?

- A. Tramadol
- B. Prednisolone
- C. Ethyl alcohol
- D. Atropine sulfate
- E. Zopiclone

**127.** What pharmacy department carries out the individual production of extemporaneous medicines, their quality control, and their dispensing to consumers?

- A. Prescription and production
- B. Ready-made dosage forms
- C. Stock of goods
- D. Over-the-counter sales
- E. Medical cosmetics

**128.** Pharmacy assets can be divided into current and non-current. What should be classified as non-current assets when drawing up the balance sheet?

- A. Buildings
- B. Goods
- C. Packaging
- D. Herbal raw materials
- E. Monetary funds

**129.** The total turnover of goods at a pharmacy consists of retail and wholesale turnover. What belongs to the wholesale turnover?

- A. Dispensing extemporaneous medicines manufactured by a pharmacy according to the inpatient prescriptions
- B. Dispensing medicines according to outpatient prescriptions
- C. Dispensing prescription medicines to the people
- D. Dispensing over-the-counter medicines to the people
- E. Dispensing medical products to outpatients

**130.** Profitability is an economic parameter that characterizes the effectiveness of the pharmacy's commercial, financial, and manufacturing activity. What parameters are used to determine the profitability of sales?

- A. Profit / turnover of goods
- B. Turnover of goods / cost price of products
- C. Cost price of products / liquidity
- D. Liquidity / solvency
- E. Turnover of goods / wages

**131.** A pharmacy has received a prescription for the preparation of a solution. What substance requires the presence of sodium chloride and a hot solvent during the dissolution?

- A. Furacilin (Nitrofurazone)
- B. Sodium iodide
- C. Urotropin
- D. Sodium bromide
- E. Streptocide (Sulfanilamide)

**132.** A pharmacy has received a prescription for the preparation of powders. What substance must be added after sterilizing the powder?

- A. Streptomycin sulfate
- B. Ephedrine hydrochloride
- C. Osarsolum
- D. Streptocide (Sulfanilamide)
- E. Magnesium oxide

**133.** *Althaea officinalis* roots require special conditions for infusion. What special technique must be used for infusion of this herbal raw material?

- A. Cold infusion
- B. The presence of sodium bicarbonate
- C. The presence of hydrochloric acid
- D. The presence of ascorbic acid
- E. Immediate filtration

**134.** A herbal raw material that contains alkaloids is being identified using a freshly prepared tannin solution. What precipitate forms as a result of this reaction?

- A. White and amorphous
- B. Red-brown
- C. Green
- D. Creamy
- E. Yellow

**135.** For authentication of a herbal raw material, several drops of an alcoholic solution of  $\alpha$ -naphthol and concentrated sulfuric acid were applied to the root section of *Cichorium intybus* L. Appearance of pink-violet coloring in the herbal raw material indicates the presence of which substance?

- A. Inulin
- B. Pectin
- C. Slime
- D. Essential oil
- E. Fatty oil

**136.** In the process of inpatient treatment of bronchial asthma, the patient was prescribed Euphylline (Theophylline) intravenously. What side effect of this drug must be managed first?

- A. Cardiotoxicity
- B. Nephrotoxicity
- C. Hepatotoxicity
- D. Hematotoxicity
- E. Chondrotoxicity

**137.** A pharmacy needs to prepare a 1% alcohol solution of methylene blue. What concentration of alcohol must be used for this purpose?

- A. 60%
- B. 90%
- C. 70%
- D. 96%
- E. 40%

**138.** A pharmacist prepares a suspension with a hydrophobic substance. What stabilizer is necessary for this dispersion system?

- A. Methyl cellulose
- B. Nipagin (Methylparaben)
- C. Sodium chloride
- D. Boric acid
- E. Glucose

**139.** What is the name of the ability to restore the properties of a heterogenous system by perturbation?

- A. Resuspension
- B. Dispersion
- C. Emulsification
- D. Granulation
- E. Extraction

**140.** What is an effective way of preserving the stability of the medicinal substances that are thermolabile and have low stability?

- A. Lyophilization
- B. Boiling
- C. Hydrolysis
- D. Ultraviolet radiation
- E. Filtration

**141.** A company manager analyzes, how effectively the available material assets are used, and identifies and eliminates the deviations arising in the course of work. What type of control is it?

- A. Current
- B. Preliminary
- C. Final
- D. Financial
- E. —

**142.** Solutions of protected colloids are used to make nasal drops. What technological procedure must be carried out when making a solution of protargol (silver proteinate)?

- A. Pour it in a thin layer onto the wide surface of water without stirring
- B. Dissolve it in a small amount of glycerin
- C. Dissolve it in the purified water by shaking
- D. Grind it with a small amount of purified water
- E. Dissolve it in the purified water during heating

**143.** A pharmacy visitor periodically feels constricting pain behind the sternum. Explain to this visitor, what contraindication exists for taking nitroglycerin.

- A. Angle-closure glaucoma
- B. Heart failure
- C. Kidney failure
- D. Peptic ulcer disease
- E. Pulmonary fibrosis

**144.** What side effect is observed in cases of long-term use of digoxin?

- A. Bradycardia
- B. Hypokalemia
- C. Hypertension
- D. Constipation
- E. Hypotension

**145.** The head manager of a company uses orders, rules, and instructions to regulate the work of the employees. What management methods are used by the head manager?

- A. Organizational
- B. Economical
- C. Psychosocial
- D. Prospective
- E. Technological

**146.** Mandatory payroll deductions are withheld from the salary of pharmacy workers. What is the tax rate on the income of natural persons?

- A. 18%
- B. 15%
- C. 20%
- D. 0%
- E. 5%

**147.** Companies draw up their balance sheets to obtain information about the availability and composition of their property. What section of the balance sheet includes accounts receivable for goods?

- A. Assets
- B. Non-current assets
- C. Equity capital
- D. Long-term liabilities
- E. Current liabilities

**148.** A pharmacy has decided to obtain a license to make extemporaneous drugs. For this purpose, it purchased a refrigerator, a cabinet dryer, and other industrial equipment. The purchased equipment belongs to the following type of assets:

- A. Fixed assets
- B. Package
- C. Goods
- D. Non-current tangible assets
- E. Not accounted as assets

**149.** The cashier of a pharmacy must record all receipt and withdrawal cash transactions in the relevant documents. What document must be drawn up for issuing cash sums to be accounted for?

- A. Disbursement cash order
- B. Expense invoice
- C. Cashier's check
- D. Profit invoice
- E. Receipt for issuing money

**150.** The medicinal plants of the *Fabaceae* family contain various groups of bioactive substances. What representative of this family contains flavonoids and is used as an industrial source of rutin?

- A.** *Styphnolobium japonicum*
- B.** *Ononis arvensis*
- C.** *Glycyrrhiza glabra*
- D.** *Thermopsis alterniflora*
- E.** *Bidens tripartita*