

**Content module 1. Technology of drugs.
STAGE 1 – TESTS**

- For the dosage of liquid preparations in home patient can use tablespoon. Specify the volume of tablespoon:
 - 3 ml
 - 5 ml
 - 10 ml
 - 15 ml
 - 20 ml
- In powders Camphor is not compatible with:
 - Dimedrol (Diphenilhydramine)
 - Sugar
 - Codeine
 - Menthol
 - Atropine
- According to the total amount of strong acting or narcotic substances in the prescription, trituration is used when:
 - The total quantity is less then 0,05
 - The total quantity is more then 0,05
 - The total quantity is less then 0,25
 - The total quantity is less then 0,1
 - The total quantity is less then 0.5
- Mention concentration for hydrogen peroxide, which pharmacist should prepare, if it is not indicated in the prescription:
 - 30%
 - 27%
 - 5%
 - 3%
 - All of the above except C
- Which of the following substances are known as solvents for liquids topical:
 - Sunflower Oil
 - Ethanol
 - Glycerol
 - Purified Water
 - All of the above
- According to the application macromolecular compounds are classified:
 - Medicinal substances
 - Dying substances
 - Different excipients
 - Only A
 - Only A and C
- When water or an aqueous solution are the disperse liquid and oil is the continuous phase the type of emulsion is known as:
 - Oil-in-water
 - Water in oil
 - None of the above
 - All of the above
 - Only A
- Pharmacist prepares an ointment with menthol. Which base does form ointment-solution with menthol?
 - Vaseline
 - Collagen base
 - Gel of Methylcellulose
 - Polyethylenoxide base
 - Phytosterine base
- Indicate the method of Ephedrinum hydrochloride introducing into hydrophobic ointment base?
 - Dissolve in minimal volume of Vaseline oil (Liquid Paraffin)
 - Dissolve in minimal volume of water
 - Introduce in ointment base by suspension's type
 - Dissolve in melted hydrophobic base
 - Use hydrophilic ointment base
- In pharmacy it is necessary to prepare semi-solid preparation on the base of gel from inorganic substances. Indicate macromolecular substance, which can be used for preparing such base.
 - Starch
 - Esters of cellulose
 - Bentonites
 - Polyethylenoxides
 - Collagen
- Which substance can be introduced into semi-solid forms as water solution to save its pharmacological effect?
 - Acrichin
 - Novocain
 - Furacillin
 - Resorcinol
 - Camphor
- All preparations prepared in the pharmacy are designed by the labels of certain standard,

depending on the method of application. What color of label must have preparations for topical use application:

- A. White
 - B. Green
 - C. Pink
 - D. Orange
 - E. Dark blue
- 13.** Specify, what technological operation is not applied at preparing of semi-solid preparations:
- A. Dissolution
 - B. Melting
 - C. Mixing
 - D. Filtration
 - E. Labeling
- 14.** Which base should be used for preparation of suppositories by rolling method?
- A. Gelatin-glycerinated base
 - B. Butyrol
 - C. Cocoa butter
 - D. Vaseline
 - E. Mixture of vaseline and lanolin
- 15.** For preparation of rectal suppositories pharmacist used indicated mass and shape. Indicate the maximal diameter of suppository:
- A. Till 4 cm
 - B. 2,0 cm
 - C. 0,5 cm
 - D. 1,5 cm
 - E. Arbitrary
- 16.** Pharmacist should sterilize 250 ml of Glucose solution for injection. What is the time of sterilization in an autoclave at the temperature of 120°C?
- A. 25 min
 - B. 8 min
 - C. 15 min
 - D. 12 min
 - E. 30 min
- 17.** Indicate auxiliary substance, which can be used as antioxidant for preparation solutions for injections in pharmacy?
- A. Sodium chloride
 - B. Ascorbic acid
 - C. Hydrochloric acid diluted
 - D. Sodium hydrocarbonate
 - E. Pottasium chloride
- 18.** A basic sign which distinguishes water for injections from purified water is:
- A. pH
 - B. Apyrogenity
 - C. Absence of mechanical impurities
 - D. Absence of heavy metals
 - E. Method of obtaining
- 19.** Labels for all preparations must contain next additional information:
- A. «Shake before use»
 - B. «Keep in a cool and protected from light place»
 - C. «Keep from children»
 - D. «Behave carefully»
 - E. «Save from a fire»
- 20.** Pharmacist prepares ophthalmic drops and for sterilization uses 100°C - 30 min. Indicate drops, which can be sterilized by this method:
- A. Drops with Riboflavine - 10 ml
 - B. Potassium iodide 3% solution - 10 ml
 - C. Protargol 1% solution - 10 ml
 - D. Levomycetin (chloramphenicol) solution 0.02% - 10 ml
 - E. Boric acid 2% solution - 100 ml

Content module 2. Industrial technology of drugs.

STAGE 1 – TESTS

- Various pharmaceutical products are produced in a pharmaceutical factory according to a technological regulation. How long technological regulation is valid?
 - 1 year
 - 3 years
 - 5 years
 - 6 months
 - 8 years
- Powders are prepared at pharmaceutical enterprise. What apparatus is used for drying powders that contain residual moisture?
 - sublimation dryer
 - air-circulation dryer
 - chamber vacuum dryer
 - dryer SG-30
 - vacuum drying oven
- What operations are included into the technological stage of wet granulation?
 - mixing the powders, granulation of wet mass
 - moistening the powders, granulation of wet mass, standardization
 - mixing the powders, moistening, granulation of wet mass, drying of wet granules
 - mixing the powders, moistening, standardization
 - moistening the powders, granulation of wet mass, dusting
- Enteric-coated tablets are produced in a tablet workshop. Specify disintegration time for this type of tablets:
 - not more than 30 min
 - not more than 15 min
 - not more than 45 min
 - must be resistant within 1 hour in 0.1 M hydrochloric acid solution, and after washing out must be resistant within 30 min in 0.1 M hydrochloric acid solution, and after washing out with water purified must disintegrate within 30 min in 0.1 M sodium bicarbonate solution
 - with water purified must disintegrate within 1 hour in 0.1 M sodium bicarbonate solution
- One of the solid dosage forms is dragee. What is the technology of this dosage form?
 - molding the wet ground mass with API and excipients
 - multiple layering the excipients onto the granules with API
 - multiple covering the tablets with sugar coat
 - multiple dry covering of granulated material onto the API
 - multiple layering the API and excipients onto the sugar granules
- During the production of gelatin capsules the gelatin mass was heated over 85°C. What negative phenomenon may occur as a result?
 - increasing of solution viscosity and denaturation of gelatin
 - albescence of gelatin solution
 - denaturation of gelatin
 - discoloration of a solution
 - appearance of extraneous odours
- Microcapsules are obtained by pan coating method. What device is used with this purpose?
 - dismembrator
 - mixer-granulator
 - friabilator
 - rotating pan
 - disintegrator
- What are features for preparing 5 % iodine alcoholic solution?
 - in large glass bottles an alcohol is poured, iodine crystals are placed in fabric sack in upper layer of ethanol. It is observed a gravitational mixing of solution.
 - potassium iodine is dissolved in ethanol at heating and stirring
 - iodide is dissolved in concentrated water solution of potassium iodine. Then ethanol is added.
 - iodide is dissolved in ethanol, and then potassium iodine is added at stirring
 - iodide and potassium iodine are simultaneously dissolved in water-alcohol solution
- Aromatic waters are prepared by distillation method. Choose apparatus needed with this purpose:
 - blade mixer, filter, distillate receiving flask
 - distilling still with steam jacket, bubbler flask, condenser, distillate receiving flask
 - herb cutter, distilling still, condenser
 - bubbler flask, condenser, distillate receiving flask
 - mixer, distilling still, distillate receiving flask
- Choose method for suspension production:
 - percolation
 - repercolation
 - dropping method
 - grinding in a liquid medium
 - maceration
- Rotary-pulsating apparatus is used in production of ointments. What operations does this apparatus do?
 - melting of base, previous grinding of powder components
 - packing of semi-solid preparations, melting of base
 - previous grinding of powder components, homogenization of semi-solid preparation
 - standardization of dosage form, melting of base
 - homogenization, packing of semi-solid preparations
- Solutions for injections are produced at pharmaceutical enterprise. What methods are used for leakage testing of ampoules filled with aqueous solutions?
 - use of low-frequency electric-field
 - application of soap water solution
 - use of high-frequency electric-field
 - application of methylene blue solution
 - flow-through method
- Injections are produced at pharmaceutical enterprise. Indicate technological stages for manufacture of Hexamethylenetetramine injection:
 - dissolution, filtration, filling and sealing of ampoules
 - dissolution, stabilization, standardization, filtration

- C. dissolution, standardization, filtration, filling and sealing of ampoules
 D. dissolution, filtration, sterilization
 E. dissolution, standardization, filtration, sterilization
14. Eye preparations are produced at a pharmaceutical factory. What method of sterilization is optimal for eye drops with thermolabile ingredients?
 A. sterile filtration
 B. addition of ascorbic acid
 C. thermal sterilization
 D. filling in the inert gas medium
 E. use of polymeric packings
15. Tinctures are produced by percolation method at the phytochemical workshop. Write time needed for maceration period:
 A. 3-4 hours
 B. 17-18 hours
 C. 7 days
 D. 14 days
 E. 24-48 hours
16. Eleuterococ liquid extract is produced at phytochemistry factory by percolation method. What apparatus is used for extract purification?
 A. vacuum evaporators and filters "KhNIKhFI"
 B. settlers and nusche filters
 C. filters "Vladipore" and "Millipore"
 D. centrifuges and nusche filters
 E. settlers and drouk filters
17. New galenic preparations are manufactured at pharmaceutical enterprise. Specify production method and extraction solvent for "Adonisyd":
 A. circulating extraction, mixture with chloroform and alcohol (95:5)
 B. counter-flow extraction, mixture with chloroform and alcohol (95:5)
 C. circulating extraction, mixture with chloroform and alcohol (50:50)
 D. counter-flow extraction, 40 % ethanol
 E. percolation, 70 % ethanol
18. Fresh plant juices are manufactured at a pharmaceutical enterprise. What apparatus is used for grinding the raw material?
 A. herb-cutters
 B. root-cutters
 C. ball mills
 D. disintegrators
 E. whirligig-machines, rollers
19. Biostimulaors are produced at the pharmaceutical factory. Choose the biomineral preparations:
 A. aloe liquid extract, aloe liniment, aloe juice, biosed
 B. peloidin, humisol, torfot, PhiBS
 C. vitreous body, placenta suspension, plasmol, solcoseryl
 D. aloe liquid extract, aloe liniment, plasmol
 E. peloidin, humisol, torfot, plasmol, solcoseryl
20. Aerosol production involves using of propellants. Specify function of propellants:
 A. solvents for medicinal substances
 B. creates of pressure in packing
 C. stabilizers
 D. dispersants
 E. emulsifying agents

STAGE 2 – SITUATION TASKS

1. Tablets are produced by compression with the addition of excipients. Match the pairs

Excipients	Function in the preparation
A. disintegrants	1. to promote cohesiveness
B. fillers	2. to prolong action
C. binders	3. to improve flowability
D. glidants	4. to obtain necessary weight of tablet
E. prolonging agents	5. to induce breakup of tablet

2. Different excipients are used in the manufacture of semi-solid preparations. Specify ingredients that are added to increase melting point and viscosity of semi-solid preparations:

- A.** paraffin
- B.** myramistin
- C.** carbomers
- D.** isopropanol
- E.** waxes

3. Indicate methods for internal washing of ampoules:

- A.** vacuum
- B.** syringe
- C.** shower
- D.** ultrasonic
- E.** vibratory

4. Extraction preparations are produced at phytochemical enterprise. Match the pairs:

Quality parameter of preparation	Method for determination
A. ethanol content	1. gas chromatography
B. propan-2-ol content	2. distillation method
C. microbiological purity	3. chemical or biological methods
D. assay of APIs	4. by picnometer
E. relative density	5. bacteriological method

5. Soft extracts are produced at pharmaceutical enterprise. Choose apparatus for thickening the extracts:

- A.** circulating vacuum evaporators
- B.** sublimation dryers
- C.** drum vacuum dryers
- D.** rotary direct-flow apparatus
- E.** froth evaporators

STAGE 3 - PRACTICAL TASKS

1. Calculate amount of excipients for manufacturing 40 kg of tablets with nitroglycerine on 0.0005/0.1 if F_a is 1.03. Specify production method and give examples of tablets produced by the same method.
2. Make working prescription for manufacture of 12 L of Belladonna tincture by percolation method if $C_{ab} = 1.5$. Indicate production methods of tinctures.