**Academic programme component** **31.05.01 General Medicine programme**

**Б1.0.27 Anatomical Pathology**
**discipline code**

# ASSESSMENT MATERIALS

**Discipline Б1.0.27 Anatomical Pathology**

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_____

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## 1. Criteria and assessment of competencies and their mastery indicators, formed by the discipline

| Code and competence name | Code and indicator of competence mastery | Results of training in the discipline (module) | | | Current assessment | Interim assessment |
|---|---|---|---|---|---|---|
| | | ***To know*** | ***To be able to*** | ***To have*** | | |
| **ОПК-5 Can analyze morphofunctional and physiological indicators as well as pathological processes in human body to achieve professional goals** | ИД-1ОПК-5. Functional, physiological conditions and pathological processes of the human body based on knowledge of the structure and principles of cell activity, development and functioning of tissues;<br><br>ИД-3ОПК-5. Defines and analyzes morphological, functional, physiological conditions and pathological processes in the human body based on knowledge about the structure and topography of internal organs | - the normal structure of organs and body systems;<br>- concepts of etiology, pathogenesis, morphogenesis, pathomorphosis of the disease;<br>- the essence and basic patterns of general pathological processes;<br>- characteristic changes in internal organs in the most important human diseases;<br>- principles of clinical and anatomical analysis of biopsy and surgical material - macroscopic and microscopic changes in pathological altered tissues and organs;<br>- an algorithm for analyzing and interpreting the results of research on biopsy and surgical material; | - evaluate and compare normal and altered morphofunctional indicators;<br>- interpret the results of research on biopsy and surgical material to solve professional problems and formulate a diagnosis according to the ICD | - skills in working with macro- and micro-preparations;<br>- skills in determining the characteristic changes of internal organs in the most important human diseases;<br>- skills in interpreting the results of research on biopsy and surgical material | - set of tasks for practice;<br>- tests;<br>- typical tasks on micro- and macro-preparations | examination card |

## 2. Competencies mastery (indicators of their mastery) level assessment

| **Competencies mastery (their indicators) indices** | **Criteria and grading system of competencies mastery (indicators of their mastery) assessment** | | | |
|---|---|---|---|---|
| | **Insufficient** *(«unsatisfactory»)* | **Sufficient** *(«satisfactory»)* | **Above average** *(«good»)* | **Advance** *(«excellent»)* |
| **Extent of knowledge** | Knowledge level is below the required. Major mistakes occurred. | Minimally allowed knowledge level. Minor mistakes occurred. | Knowledge level corresponds well to the educational programme. Minor errors occurred. | Knowledge level corresponds well to the educational programme. |
| **Ability mastery** | Basic abilities were not demonstrated during standard tasks completion. Major mistakes occurred. | Basic abilities were demonstrated. All tasks were completed, yet not in full (clarifications are absent, conclusions are incomplete) | All main abilities were demonstrated. All tasks were completed in full, yet with few errors. | All main abilities were demonstrated. All main and additional tasks were completed without mistakes or errors. |
| **Skill mastery (having experience)** | Basic skills were not demonstrated during standard tasks completion. Major mistakes occurred | Minimum set of skills for standard tasks completion with minor error, is acquired. | Basic skills were demonstrated in completing standard tasks, yet with few errors. | All main skills were demonstrated in completing main and additional tasks without mistakes or errors. |
| **Competence mastery characteristics** | Insufficient number of credit points as per the established range. | Competencies mastery is adequate. The acquired knowledge, abilities, and skills are mostly sufficient to complete professional tasks. | Competencies mastery mainly satisfies the requirements. The acquired knowledge, abilities, and skills are mainly sufficient to complete professional tasks. | Competencies mastery satisfies the requirements to the full extent. The acquired knowledge, abilities, and skills are fully sufficient to complete difficult professional tasks, including non-standard. |

## 3. Criteria and grading system of the formative assessment tasks

### 3.1. Criteria and grading system of practical tasks

The list of practical tasks, task completion and presentation recommendations, requirements for results, structure, and contents of practical task report, etc., are presented in the methodological guidelines on mastering the discipline as well as in MAU LMS Moodle.

| Grade/points | Assessment criteria |
|---|---|
| ***Excellent*** | The task is completed correctly and in full. The report is well prepared and satisfies the requirements. Answers to the teacher's questions (during the presentation) are full. |
| ***Good*** | The task is completed in full, yet without sufficient justification or a minor error, which does not impact the argumentation sequence, occurred. All task completion requirements are satisfied. |
| ***Satisfactory*** | The task is completed partially, with mistakes. Adequate level of task completing practical tasks. Majority of task completion requirements are satisfied. |
| ***Unsatisfactory*** | The task is completed poorly, with a considerable number of mistakes. Majority of task completion requirements are not satisfied. |

### 3.2. Criteria and grading system of tests

The list of test questions and tasks, as well as test procedure description are presented in the methodological guidelines on mastering the discipline as well as in MAU LMS Moodle.

Assessment materials include a typical test variant:

*Choose one correct answer*

1. DYSTROPHY IS

1) Lethal cell damage

2) A pathological process characterized by a reaction of the microcirculatory bed aimed at the elimination of a foreign agent

3) A pathological process characterized by a reversible or irreversible violation of cellular metabolism of cells and/or extracellular matrix

4) A pathological process characterized by reversible or irreversible disorganization of connective tissue

2. SPECIFY THE CAUSE OF LOCAL HEMOSIDEROSIS

1) Intravascular hemolysis

2) Extravascular hemolysis

3) Violation of porphyrin metabolism

4) Cholemia

5) Stagnation of bile

3. APOPTOTIC BODIES UNDERGO

1) Autolysis

2) Heterolysis

3) Phagocytosis

4) Sliming

5) Encapsulation

4. ANASARCA IS

1) Lymphedema

2) Edema in subcutaneous fat

3) Portal veins congestion
4) Hydrocele
5) Swelling

| Grade/points | Assessment criteria |
|---|---|
| ***Excellent*** | 90-100% of correct answers |
| ***Good*** | 70-89% of correct answers |
| ***Satisfactory*** | 50-69% of correct answers |
| ***Unsatisfactory*** | 49% or less of correct answers |

3.3. Criteria and grading system of case tasks

Recommendations on case task solving are presented in the methodological guidelines on mastering the discipline and in MAU LMS Moodle.

Assessment materials include a typical case task:

1. Situational task №1

A 44-year-old female patient suffered from rheumatism with mitral valve damage since childhood. She was admitted to the cardiology department with signs of decompensation of mitral stenosis: acrocyanosis, shortness of breath, orthopnea, edema, abdominal enlargement due to accumulation of edematous fluid. When coughing, sputum with a brown tinge was released. Death occurred from chronic heart failure.

Questions to the situational task №1

1. What circulatory disorder was found upon autopsy?
2. Describe the macroscopic changes in the lungs. Explain the morphogenesis of lung changes.
3. Why did the patient's sputum have a rusty tinge?
4. Name the changes in the serous cavities characteristic of chronic cardiovascular insufficiency. Explain the morphogenesis of these changes.
5. Give a description of macroscopic changes in the liver in chronic cardiovascular insufficiency. Explain the morphogenesis of liver changes.
6. Explain the occurrence of shortness of breath in the patient in the terminal period.

2. Situational task №2

A 50-year-old male patient, suffering from atherosclerosis of the left renal artery, developed dizziness and weakness in the left extremities. The patient died in an ambulance. Upon autopsy, there was an accumulation of blood in the subcortical nuclei of the right hemisphere of the brain.

Questions to the situational task №2

1. What are the macroscopic features of the left kidney?
2. Name the reason and give a description of the energy metabolism of the cells of the left kidney.

3. Name the mechanisms of ischemia.

4. What is the mechanism of blood leaving the bloodstream in this observation?

5. Name the type of circulatory disorder in the brain.

| Grade/points | Assessment criteria |
|---|---|
| ***Excellent*** | The requirements are fully satisfied. Systemic and situational approaches are applied. Justified argumentation is given. Goals, tasks, case occurrence reasons are determined. Risks, difficulties in problem solving are identified. Action plan is devised. |
| ***Good*** | Goals, tasks, case occurrence reasons are determined correctly. Risks, difficulties in problem solving are identified. Action plan is devised, yet conclusions are not clear and consecutive enough. |
| ***Satisfactory*** | Argumentation on the problem is given; goals, tasks, case occurrence reasons are determined. Possible cause-effect relationship are identified, and conclusions are incomplete. |
| ***Unsatisfactory*** | Possible causes of the pathology are not identified. No goals, objectives, or results of upcoming activities are given. Conclusions are not presented. |

### 3.4. Criteria and grading system of working with preparations

**Micropreparations**

1. Coagulation necrosis of muscles. Tinging with hematoxylin and eosin. Lumpy disintegration and cytolysis of muscle fibers (a), the stroma is edematous, infiltrated by leukocytes, with foci of hemorrhages (b).

2. Caseous necrosis of the lymph node in tuberculosis. Tinging with hematoxylin and eosin. Merging foci of caseous necrosis (a) are visible in the lymph node, surrounded by epithelioid cells and lymphocytes, among which Pirogov-Langhans cells (b) are found.

3. Anemic kidney infarction. Tinging with hematoxylin and eosin. The necrosis zone (a) is separated from the preserved kidney tissue by a zone of sharp fullness and leukocyte infiltration (b).

4. Anemic infarction of the spleen. Tinging with hematoxylin and eosin. In the necrosis zone, a structureless eosinophilic mass (a) is visible, at high magnification, hyperchromic, irregularly shaped nuclei of lymphocytes (karyopycnosis) are visible in this zone, as well as many small randomly arranged lumps of chromatin (karyorexis).

5. Hemorrhagic lung infarction. Stained with hematoxylin and eosin. In the necrosis zone, the alveoli and interalveolar septa are soaked with blood.

**Macropreparations**

1. Anemic kidney infarction. Preparation contains a part of the kidney, an irregular triangular area is visible, gray in color, with clear edges.

Reasons: spasm, thrombosis, embolism of the renal arteries.

Outcome: organization, scar formation.

2. Hemorrhagic lung infarction. Preparation contains a part of the lung, an irregularly shaped area is visible, dark red in color, and reduced airiness.

Causes: circulatory disorders.

Outcome and complications: hemoptysis, respiratory failure.

3. Curd necrosis of lymph nodes in tuberculosis. Preparation contains the lymph nodes of several groups (para-tracheal, bronchial) are slightly enlarged, and the lymphoid tissue is replaced by white-yellow crumbling necrotic masses on the incision.

Causes: mycobacterium tuberculosis.

Outcome: organization, petrification.

4. Gangrene of the toes (dry). Preparation contains a part of the foot reduced in volume, soft tissues are thinned, the skin is dry, dark gray in the form of "parchment". The zone of demarcation inflammation is clearly expressed.

Causes: circulatory disorders in atherosclerosis of the vessels of the lower extremities, diabetes mellitus.

Outcome and complications: mutation, amputation of the foot is indicated.

| Grade/points | Assessment criteria |
|---|---|
| ***Excellent*** | Correctly demonstrates the methodology for describing macro-, micro-preparations, justifies the diagnosis, predicts the outcome of the pathological process and its possible complications; presented a full report on the work |
| ***Good*** | Correctly demonstrates the methodology for describing macro-, micro-preparations; makes insignificant mistakes in describing morphological changes, justifying the diagnosis, predicting the outcome of the pathological process and its possible reasons; presented a full report on the work |
| ***Satisfactory*** | Correctly demonstrates the methodology for describing macro-, micro-preparations, gives a partially correct but incomplete description of morphological changes, makes significant mistakes in making a diagnosis, predicting complications, and determining the causes. The report is incomplete, with errors. |
| ***Unsatisfactory*** | Makes major errors in describing macro- or micro-preparation, the answer is partially correct with a violation of the pathogenetic and logical sequence; several major errors were made, cannot diagnose the pathological process, predict possible outcomes and complications and establish the cause. |

## 4. Criteria and grading system of the discipline results during the interim assessment

4.1. Criteria and grading system of the discipline results

For the disciplines that are graded upon examination, the interim assessment result is comprised of points gained during the formative assessment and after the examination:

Assessment materials include the list of questions and tasks for the examination:

**Questions for preparing students for the interim assessment (exam)**
**in the discipline "Anatomical Pathology"**
**Educational programme 31.05.01 “General Medicine”**

## General theoretical questions

1. Tasks and methods of pathological anatomy. The importance of the pathology service in the system of practical healthcare.
2. Dystrophy. Definition, causes, morphogenetic mechanisms, structural levels, outcomes. Classification of dystrophies.
3. Parenchymal dystrophy, their types. Parenchymal dysproteinosis: varieties, morphological characteristics, causes, pathogenesis, outcomes. Hereditary parenchymal dysproteinosis.
4. Parenchymal dystrophy, their types. Parenchymal lipodystrophy and carbohydrate dystrophy. Causes of development, pathogenesis, morphological characteristics.
5. Stromal vascular (mesenchymal) dystrophies, their types. Mesenchymal protein dystrophy, their types. Classification of amyloidosis and morphological characteristics of its forms.
6. Mesenchymal protein dystrophy, varieties. Classification of hyalinosis and morphological characteristics of its forms.
7. Mesenchymal fatty dystrophy associated with impaired metabolism of neutral fat, cholesterol. General obesity. Causes, pathogenesis, varieties, morphological characteristics.
8. Mesenchymal fatty degenerations associated with impaired metabolism of neutral fat. Cachexia: causes, pathogenesis, varieties, morphological characteristics.
9. Mixed dystrophies, definition, classification. Violation of the metabolism of hemoglobinogenic pigments.
10. Types of chromoproteins. Impaired metabolism of proteinogenic and lipidogenic pigments.
11. Disorders of nucleoprotein metabolism: types, causes, morphological manifestations.
12. Mineral dystrophy. Calcinoses, their types, causes, pathogenesis, morphological characteristics.
13. Formation of stones. The causes and mechanism of stone formation. Types of stones. The consequences of stone formation.
14. Necrosis. Definition, stages. Causes, mechanism of development, morphological characteristics. Classification of necrosis depending on the cause and mechanism of action of the pathogenic factor.
15. Clinical and morphological forms of necrosis, their characteristics, significance, outcomes.
16. Death: definition, types. The mechanism of dying and the signs of death. Posthumous changes.

17. Circulatory disorders, their types. Fullness of blood: arterial and venous, general and local; Morphological changes in organs in acute and chronic venous congestion.

18. Shock, definition, causes, classification and pathological anatomy. Local anemia. Causes, types, morphology. The outcomes.

19. Bleeding: definition, causes, types, morphology, outcomes, meaning.

20. Thrombosis: definition, causes, mechanisms of thrombosis. Types of blood clots. Blood clot outcomes. The significance of thrombosis.

21. Embolism: definition, types, outcomes, meaning. Pulmonary embolism.

22. Edema: causes, mechanism of development, types, morphological characteristics, outcomes. Dropsy of cavities. Exicosis.

23. Inflammation: definition by Garshin, biological essence. Etiology, pathogenesis and morphological components of inflammation. Factors of regulation and classification of inflammation.

24. Classification of inflammation. Exudative inflammation, its types. Characteristics of purulent inflammation.

25. Inflammation. Definition by Garshin. Types of exudative inflammation. Characteristics of fibrinous inflammation.

26. Inflammation. Definition by Garshin. Morphological characteristics of productive and specific inflammation.

27. Immunopathological processes. Morphology of immunogenesis disorders. An immediate and delayed hypersensitivity reaction. Autoimmune diseases. Immunodeficiency syndromes.

28. Compensatory and adaptive processes. The essence, biological significance of adaptation and compensation. Regeneration: definition, forms, morphogenesis and morphological characteristics of reparative regeneration.

29. Regeneration, its types, morphological characteristics of pathological regeneration. Features regeneration of blood, bone tissue and peripheral nerve.

30. Hypertrophy and hyperplasia, morphological characteristics, classification.

31. Atrophy: definition, classification, causes and varieties of general and local atrophy, morphology, meaning.

32. Organization, definition, main varieties. Wound healing. Metaplasia: essence, localization, outcomes.

33. Tumor: definition, essence of tumor growth. Modern theories of tumor growth, precancerous conditions, the concept of tumor progression. The body's immune response to a tumor.

34. Tumor: definition, structure of the tumor, types of atypism and growth.

35. Benign and malignant tumors, tumors with locally destructive growth. Types of tumor metastasis. Secondary changes in tumors. The effect of the tumor on the body.

36. Modern classification of tumors, principles of its construction. Epithelial tumors without specific localization. Cancer, its types.

37. Organ-specific tumors of the skin, breast, thyroid and pancreas.

38. Organ-specific tumors of the uterus, ovaries, and testicles.

39. Organ-specific tumors of the kidneys, pancreas, liver, stomach and intestines.

40. Mesenchymal tumors: sources of development, nomenclature of benign and malignant mesenchymal tumors, features of growth and metastasis.

41. Types of tumor growth and metastasis. Benign and malignant tumors of melanin-forming tissue. Tumors of the peripheral nervous system.

42. Tumors of the nervous system and brain membranes, their classification. Neuroectodermal and meningovascular tumors.

43. Anemia. Causes, types, classification. Posthemorrhagic and hemolytic anemia, anatomical pathology.

44. Anemia due to impaired blood formation. Classification, causes, anatomical pathology.

45. Tumors of the blood system. Classification. Leukemia: etiology, pathogenesis, morphology, causes of death of patients.

46. Acute leukemia: classification, anatomical pathology.

47. Chronic leukemia of the myelocytic series, anatomical pathology.

48. Chronic lymphocytic leukemia, anatomical pathology.

49. Lymphomas. Causes, pathogenesis, forms. Lymphogranulomatosis, clinical and morphological classification, morphological characteristics.

50. Acquired heart defects, their causes, morphological characteristics of decompensated heart failure.

51. Atherosclerosis. Etiology, pathogenesis, stages (macro- and microscopic).

52. Clinical and morphological forms of atherosclerosis, their characteristics.

53. Arterial hypertension. Etiology, pathogenesis, stages, their morphological characteristics.

54. Clinical and morphological forms of essential hypertension, characteristics, causes of death.

55. Coronary heart disease. Etiology, risk factors, pathogenesis, classification. Morphological substrate of acute and chronic coronary heart disease.

56. Myocardial infarction. Pathological anatomy, characteristics of stages, complications, causes of death.

57. Chronic coronary heart disease. Pathological anatomy, complications, causes of death.

58. Rheumatism: etiology, pathogenesis, morphogenesis of rheumatism. Clinical and morphological forms of rheumatism. Complications, causes of death.

59. Systemic lupus erythematosus. Etiology, pathogenesis. Changes in blood vessels, kidneys, heart and the spleen. Complications, causes of death.

60. Acute pneumonia, classification. Bronchopneumonia. Etiology, pathogenesis, pathological anatomy. Features of bronchopneumonia depending on the nature of the pathogen and the age of the patient.

61. Lobar pneumonia: etiology, pathogenesis of croup pneumonia and stages according to the teachings of V.D. Tsinzerling, complications and causes of death.

62. Chronic nonspecific lung diseases. Etiology, pathogenesis. Classification. Chronic bronchitis, bronchiectasis, chronic abscess, chronic pneumonia.

63.Chronic obstructive pulmonary diseases. Classification. Emphysema of the lungs. Etiology, pathogenesis, pathological anatomy. Atelectasis and lung collapse.

64. Lung cancer: prevalence, etiology. Classification of lung cancer based on localization, growth pattern, macroscopic shape and microscopic appearance. Metastasis of lung cancer. Complications and causes of death.

65. Morphological characteristics of central and peripheral lung cancer. Complications.

66. Peptic ulcer disease: definition, etiology, main factors in the pathogenesis of peptic ulcer disease. Morphology of chronic ulcers: macro- and microscopic picture during exacerbation and remission.

67. Classification of complications of peptic ulcer disease according to Samsonov, their characteristics.

68. Stomach cancer: frequency, precancerous diseases. Clinical and anatomical classification of gastric cancer, taking into account localization, growth pattern, macroscopic shape.

69. Stomach cancer. Pathological anatomy of cancer with a predominant exophytic growth pattern. Metastasis.

70. Stomach cancer. Morphology of cancer with a predominant endophytic growth pattern. Histological forms. Metastasis.

71. Pancreatic cancer: frequency, precancerous diseases, morphological characteristics, metastasis.

72. Appendicitis: etiology, pathogenesis, classification. Pathological anatomy of acute and chronic appendicitis. Complications and causes of death.

73. Colon cancer: frequency, precancerous diseases, macro- and microscopic forms, metastasis.

74. Liver diseases. Classification. Toxic liver dystrophy (massive liver necrosis): etiology, pathological anatomy, outcomes, causes of death.

75. Fatty hepatosis. Etiology, pathogenesis, pathological anatomy.

76. Hepatitis: etiology, classification, pathological anatomy, outcomes and causes of death.

77. Viral hepatitis. Etiology, pathogenesis. Clinical and morphological forms. Pathological anatomy of cyclic jaundice.

78. Alcoholic hepatitis. Pathogenesis, morphology of acute and chronic alcoholic hepatitis, outcomes.

79. Cirrhosis of the liver: etiology, pathogenesis and morphogenesis. Classification of cirrhosis, their morphological characteristics. Complications, causes of death.

80. Liver cancer. Precancerous diseases. Macro- and microscopic forms of cancer. Metastasis, complications.

81. Kidney diseases. Modern clinical and morphological classification. Non-inflammatory glomerulopathy: essence, causes, classification.

82. Glomerulonephritis. Morphology of acute, subacute and chronic glomerulonephritis. Complications, outcomes.

83. Amyloidosis of the kidneys. Etiology, pathogenesis, pathological anatomy, stages of renal amyloidosis, complications, outcomes.

84. Acute renal failure. Causes, pathogenesis, morphology, complications, outcomes.

85. Pyelonephritis: etiology, pathogenesis, pathological anatomy of acute and chronic pyelonephritis, complications and outcomes.

86. Kidney stone disease. Etiology, pathogenesis, pathological anatomy, complications.

87. Nephrosclerosis. Causes, types. Morphological characteristics. Pathomorphology of chronic renal failure.

88. Dishormonal diseases of the female genital area. Glandular endometrial hyperplasia, its types. Pseudo-erosion. Morphological characteristics, complications.

89. Breast cancer. Precancerous diseases. Classification, morphological characteristics, metastasis, complications, causes of death.

90. Ectopic pregnancy. Causes, types. Morphological characteristics, complications of tubal pregnancy.

91. Diseases of pregnancy and the postpartum period. Spontaneous and artificial abortion, premature birth, cystic drift, placental polyp. Causes, morphology, complications.

92. Gestosis. Classification, pathological anatomy, complications and causes of death.

93. Cerebro-pituitary diseases. Classification. Morphology.

94. Addison's disease: causes, pathogenesis, morphology, complications.

95. Goiter. Classification. Etiology, pathological anatomy, complications of endemic and sporadic goiter.

96. Graves' disease. Causes, morphology, complications, causes of death.

97. Diabetes mellitus: etiology, pathogenesis, pathological anatomy. Types of angiopathies. Diabetic nephropathy. Causes of death in diabetes mellitus.

98. Infectious diseases, definition. Characteristics of the infectious process. Immunomorphology of infections. Classification of infectious diseases.

99. HIV infection: epidemiology, etiology, pathogenesis, morphology. Complications, causes of death.

100. General characteristics of ARVI. Influenza: etiology, pathogenesis, pathological anatomy, complications, causes of death.

101. Typhoid fever: etiology, pathogenesis, pathological anatomy. Intestinal and extra-intestinal complications, causes of death.

102. Salmonellosis: etiology, pathogenesis, pathological anatomy, complications.

103. Dysentery: etiology, pathogenesis, pathological anatomy. Complications, causes of death.

104. Cholera: etiology, pathogenesis, pathological anatomy. Specific and non-specific complications of cholera, causes of death.

105. Anthrax: etiology, pathogenesis, pathological anatomy, causes of death.

106. Tuberculosis: etiology, pathogenesis, classification. The pre-complex period. Primary tuberculosis complex.

107. Pathomorphology of primary tuberculosis, possible course options, outcomes.

108. Hematogenic tuberculosis. Classification. Characteristics of generalized hematogenic tuberculosis.

109. Hematogenic tuberculosis, classification. Characteristics of hematogenic tuberculosis with predominant lung damage.

110. Hematogenic tuberculosis, classification. Characteristics of hematogenous tuberculosis with primary extrapulmonary lesion.

111. Secondary tuberculosis. Classification, anatomical pathology, complications.

112. Syphilis: etiology, pathogenesis, anatomical pathology of primary, secondary and tertiary syphilis.

113. Sepsis as a special form of the development of the infectious process. Differences between sepsis and other infections. Etiology, pathogenesis. The relationship between macro- and micro-organism. Classification of sepsis.

114. Anatomical pathology of various clinical and anatomical forms of sepsis.

115. Infectious (bacterial) endocarditis. Etiology, classification, anatomical pathology.

116. Measles: etiology, pathogenesis, anatomical pathology, complications, causes of death.

117. Diphtheria: etiology, pathogenesis, anatomical pathology, complications, causes of death.

118. Scarlet fever: etiology, pathogenesis, anatomical pathology of various clinical and morphological forms. Complications and causes of death.

119. Meningococcal infection: forms, anatomical pathology, complications and causes of death.

120. Herpes infection. Etiology, pathogenesis, morphology, complications, causes of death.

121. Prenatal pathology. Gametopathy. Blastopathy. Embryopathy. The most important congenital malformations.

122. Perinatal non-infectious pathology: asphyxia, pneumopathy, hemolytic disease of newborns.

123. Perinatal infectious pathology: cytomegaly, toxoplasmosis, listeriosis, congenital syphilis.

124. Prenatal and perinatal period. Periodization. Birth trauma: definition, causes, classification, pathological anatomy.

**List of examination macropreparations**

1. Saucer-shaped stomach cancer.
2. Nephrolithiasis (kidney stones with hydronephrosis).
3. Nutmeg liver.
4. Chronic glomerulonephritis (secondary wrinkled kidney).
5. Fatty liver (steatosis).
6. Polycystic kidney (adult type).
7. Rhabdomyosarcoma of the hip.
8. Cirrhotic tuberculosis.
9. Hydatidiform mole.
10. Colloid goiter.
11. Miliary pulmonary tuberculosis.
12. Large-focal postinfarction cardiosclerosis.
13. Hypernephroid cancer.
14. Melanoma metastases to the liver.
15. Lobar pneumonia.
16. Brain hemorrhage.
17. Serous ovarian cyst (serous cystadenoma).
18. Hemangioma of the liver.
19. The "greasy" spleen.
20. Fibroplastic endocarditis of the mitral valve.
21. Apostematous nephritis.
22. Purulent leptomeningitis.
23. Chronic gastric ulcer with perforation.
24. Small-nodular cirrhosis of the liver.

25. Central lung cancer.

26. Parietal thrombus in the aorta.

27. Gastric polyposis.

28. Tuberculosis of the kidney.

29. Cancer of the uterine body.

30. Uterine fibroids

**List of examination micro-preparations**

1. Necrotic nephrosis

2. Tuberculosis of the lymph node

3. Hydronephrosis

4. Spot hemorrhages in the brain

5. Glandular endometrial hyperplasia

6. Nutmeg liver

7. Thrombus with organizational phenomena

8. Amyloidosis of the kidney (tinge: Congo-red)

9. Myocardial obesity

10. Fatty liver disease

11.Hyalinosis of the spleen vessels

12.Hashimoto's autoimmune thyroiditis

13.Lobar pneumonia

14. Purulent meningitis

15.Acute purulent pyelonephritis

16. Cirrhosis of the liver (tinge: hematoxylin and eosin)

17. Cirrhosis of the liver (Van Gieson’s picro-fuchsin)

18. Lymph node in Hodgkin's lymphoma

19. Miliary pulmonary tuberculosis

20.Granulation tissue

21. Cavernous hemangioma of the liver

22.Fibroadenoma of the breast

23. Papilloma of the skin

24. Brown lung induration

25.Squamous cell lung cancer

26. Gastric mucosal cancer

27. Polymorphocellular sarcoma

28.Melanoma of the skin

29.Macro-microfollicular (colloidal)

30. Rheumocarditis -

31.Toxic liver dystrophy

32. Liver in chronic myeloid leukemia

33. Phlegmonous appendicitis

34.Adenocarcinoma of the colon

35. Fibrinous pericarditis

36.Polypous ulcerative endocarditis

37. Chronic fibroplastic glomerulonephritis

38. Bronchopneumonia

39.Atherosclerosis of the aorta (tinge: Sudan III)

40.Large-focal postinfarction cardiosclerosis (tinge: Van Gieson's picro-fuchsin)

41.Chronic gastric ulcer

42. The brain in acute myeloid leukemia

43. Myocardial infarction with organizational phenomena

44. Asthmatic bronchitis

45.Tissue embolism of lung vessels

46. Chronic bronchitis with bronchiectasis

47. Purulent hemorrhagic pneumonia in influenza

48. Pituitary gland in hemorrhagic fever

49.Liver in chronic lymphocytic leukemia

50.Kidney in hemorrhagic fever

51. Kidney in diabetes mellitus (PAS-reaction)

52.Phlegmon of fatty tissue

53. Ischemic cerebral infarction

54. Purulent fibrinous pleurisy

55. The adrenal gland in meningococcal infection

**Typical examination card variant**

MINISTRY OF SCIENCE AND HIGHER EDUCATION OF THE RUSSIAN FEDERATION
FEDERAL STATE AUTONOMOUS EDUCATIONAL
INSTITUTION OF HIGHER EDUCATION
**"MURMANSK ARCTIC UNIVERSITY"**
**EXAMINATION CARD** № 1

**on the discipline "Anatomy"**

Question 1. Tasks and methods of pathological anatomy. The importance of the pathology service in the system of practical healthcare
Question 2. Regeneration, its types, morphological characteristics of pathological regeneration. Features regeneration of blood, bone tissue and peripheral nerve.
Question 3 Tuberculosis: etiology, pathogenesis, classification. The pre-complex period. Primary tuberculosis complex.
Question 4. Macro-preparation: lobar pneumonia
Question 5. Micro-preparation: Phlegmonous appendicitis

The examination cards were reviewed and approved at the department meeting dated «_____» _____2024, record no. _____

Head of the Clinical Medicine Department _____ Krivenko O.G.

| Grade | Assessment criteria (theoretical question) |
|---|---|
| ***Excellent*** | Student understands the material thoroughly; reproduces it fully, clearly and logically; applies theory to practice; has no inhibitions in answering an altered question. Uses specific terminology; demonstrates extensive knowledge in the subject; provides references to specialized resources, including online-resources, while answering the questions. |
| ***Good*** | Student understands the material thoroughly; reproduces it logically and to the point, without major errors in answering the question; uses specific terminology well; may experience some difficulties in answering clarifying questions on the subject; generally demonstrates extensive knowledge in the subject |
| ***Satisfactory*** | Student understands only basic material without details; makes mistakes and not fully correct wording; is poorly familiar with specific terminology; makes significant mistakes in answering; poorly uses special information resources. |
| ***Unsatisfactory*** | Student does not understand a major part of the material, makes significant mistakes, violations of the logical sequence in presenting the material, does not know special terminology, does not use special information resources. |
| **Grade** | **Assessment criteria (working with preparations)** |
| ***Excellent*** | Showed deep knowledge in the description of micro- and macro-preparations, made reasonable conclusions, and showed original thinking simultaneously |
| ***Good*** | Showed good knowledge in the description of micro- and macro-preparations, made reasonable conclusions, showed original thinking, but made insignificant mistakes and inaccuracies |
| ***Satisfactory*** | Resorted to the teacher's help when describing micro- and macro-preparations, made significant mistakes and inaccuracies |
| ***Unsatisfactory*** | Experienced difficulties in describing micro- and macro-preparations, made significant mistakes |

The grade, earned at the examination, is then converted into points ("5/excellent" – 20 points; "4/good" – 15 points; "3/satisfactory" – 10 points) and is added to the points, earned during the formative assessment.

| Final grade | Total sum of points | Assessment criteria |
|---|---|---|
| ***Excellent*** | 91 - 100 | All checkpoints of the current assessment have been completed at a high level. The exam is passed. |
| ***Good*** | 81-90 | All checkpoints of the current assessment have been completed. The exam is passed. |

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| ***Satisfactory*** | 70- 80 | Checkpoints of the current assessment have been completed partially. The exam is passed. |
| ***Unsatisfactory*** | 69 or less | Checkpoints of the current assessment have not been completed or the exam is not passed |

## 5. Diagnostic tasks for the assessment of educational results in the discipline (module) within the framework of internal and external independent assessment of the quality of education

Assessment materials contain tasks for assessing knowledge, skills and abilities that demonstrate the level of competence mastery and indicators of their mastery.

The set of tasks is designed so as to assess each competence in written form.

The set of tasks includes: *situational tasks, practice-oriented tasks*.

**ОПК-5 Can analyze morphofunctional and physiological indicators as well as pathological processes in human body to achieve professional goals**

### Set of tasks for diagnostics

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| 1 | Task 1. A 22-year-old patient was admitted to the hospital with complaints of fever, weight loss, weakness, and enlargement of cervical lymph nodes. In the general blood test, the content of shaped elements without deviations from the norm, ESR – 49 mm / h. An X-ray examination of the lungs revealed an expansion of their roots as a result of an increase in lymph nodes. One of the cervical nodes was taken for histological examination. **Histological conclusion**. Granulomas consisting of epithelial, lymphoid cells, and giant multinucleated Langhans-type cells were found in the lymph node tissue.<br>**Conclusion**. Productive granulomatous inflammation, morphologically more consistent with tuberculosis etiology.<br>**Questions**: 1. What material was sent for examination to the pathology department: a) surgical, b) biopsy, c) puncture biopsy material, d) aspiration biopsy material.<br>2. The nature of the pathologist's response: a) the final diagnosis, b) an indicative diagnosis, c) a descriptive answer.<br>3. What is necessary to establish a final diagnosis: a) consultation with an oncologist, b) consultation with a phthisiologist, c) thorough clinical and morphological analysis.<br>**Answers: 1) b; 2) b; 3) c**<br><br>**Task 2. Give definition: Amyloidosis is** a pathological condition caused by the formation of a chemically complex substance that does not form normally – amyloid. This protein consists of fibrous structures and blood plasma components. The mechanism of development is reverse synthesis, in which amyloid fibrils are synthesized from a number of precursors by various cells (macrophages, monocytes, plasma and other cells). As a result of the accumulation of amyloid, parenchymal organs (kidneys, spleen, liver) increase in size, become dense and brittle, have a waxy, greasy appearance on the incision. When stained with hematoxylin-eosin, amyloid deposits exhibit eosinophilia, and when histochemically stained with congo red, they turn brown-red.<br>**Task 3. Look at the photo, describe the drug, suggest pathology** |

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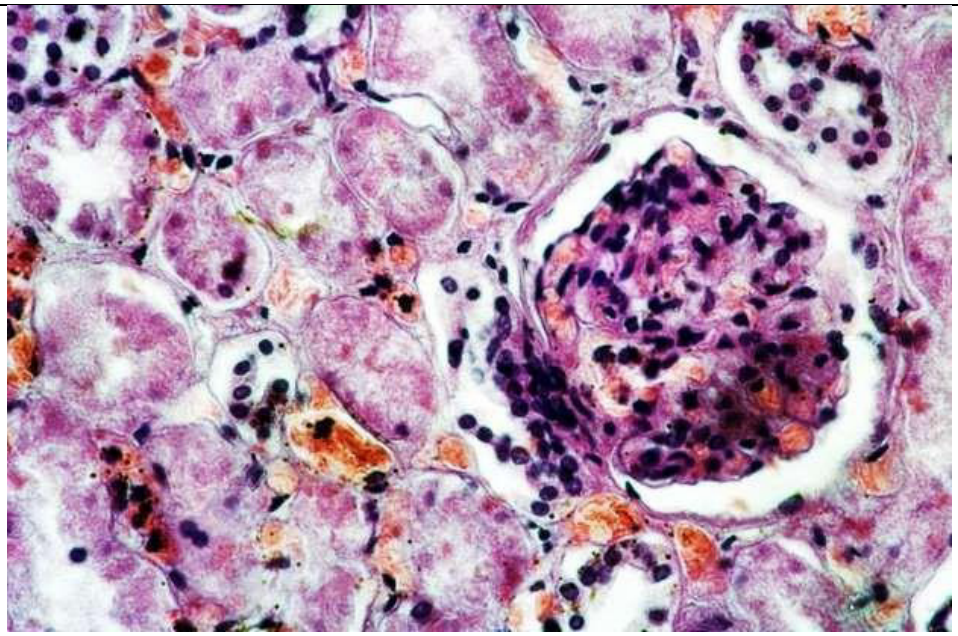
| |  <br>**Answer:** Ballooning degeneration (cloudy swelling) of the epithelium of the renal tubules. Stained with hematoxylin and eosin. The magnification is large. The epithelial cells of the proximal convoluted tubules are enlarged in size, the cytoplasm contains fine-point granularity, the nuclei and boundaries between the cells are indistinct, the lumen of the tubules has a stellate shape<br>**Task 4.** A patient suffering from chronic glomerulonephritis had arterial hypertension for a number of years. Death occurred from acute heart failure.<br>1. What macroscopic changes of the heart can be detected at an autopsy, in which parts of it mainly?<br>2. What process are we talking about, name it?<br>3. What is the type of this process depending on the mechanism of development?<br>4. What is the stage of the process?<br>**Answer:**<br>1. Enlargement of the heart due to the left ventricle, expansion of cavities.<br>2. Hypertrophy.<br>3. Compensatory (working).<br>4. Decompensation. |
| 2 | **Task 1.** A 50-year-old patient was admitted to the hospital with complaints of weakness, weight loss, enlargement of the cervical and subclavian lymph nodes. In the general blood test, moderate anemia, ESR 39 mm / h. One of the cervical lymph nodes was taken for histological examination.<br>**Histological conclusion**. In the lymph node tissue, the growth of adenocarcinoma of a moderate<br>degree of differentiation.<br>**Questions:** 1. Which fixing solution should be used: a) 10% acidic<br>formalin, b) 10% neutral formalin solution, c) 40% formalin solution, d) 96 ° alcohol,<br>e) saline solution.<br>2. What kind of biopsy is it, depending on the response time: a) urgent, b) planned, c) targeted.<br>3. The nature of the pathologist's response: a) the final diagnosis, b) an indicative diagnosis, c) a descriptive answer.<br>4. Which organs and systems must first be examined to establish the underlying disease: a) organs of the cardiovascular system, b) the system of organs of hematopoiesis, c) the central nervous system, d) organs of the gastrointestinal tract.<br>**Answers: 1) b, 2) b, 3) b, 4) d** |

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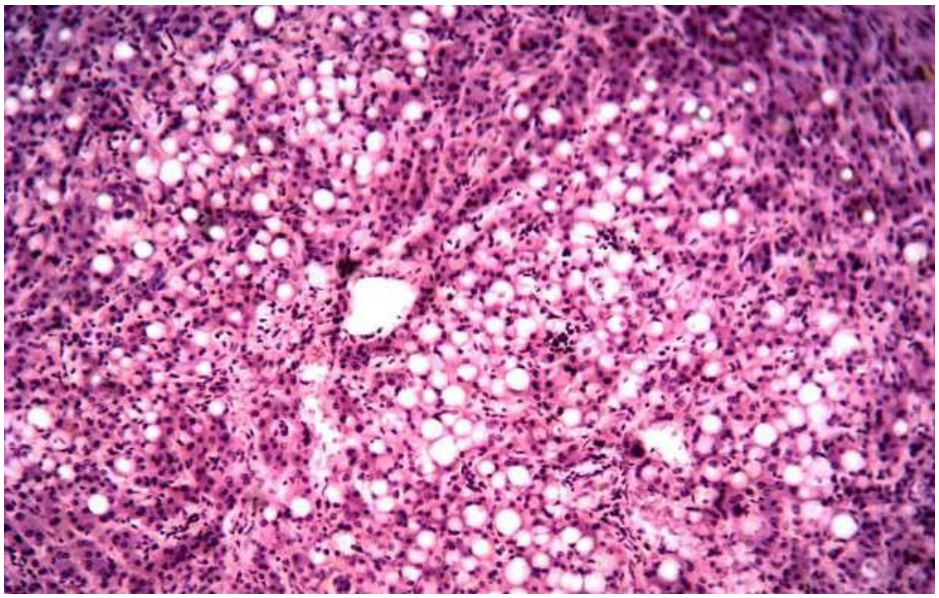
| | **Task 2**. Give definition: **Fibroblasts are** the predominant population of cells of loose fibrous connective tissue. They are heterogeneous in terms of maturity and functional specificity. The predominant form is mature fibroblasts, whose function is the synthesis and release into the intercellular medium of proteins − collagen and elastin, as well as glycosaminoglycans, from which extracellularly the formation of various types of fibers and amorphous matter is carried out<br>**Task 3. Look at the photo, describe the drug, suggest pathology**<br>**Answer**: Fatty liver ("goose liver"). *Stained with hematoxylin and eosin. The magnification is small.*<br>Rounded optical voids are found in hepatocytes, which were formed in place of lipid droplets as a result of their dissolution during the manufacture of the drug<br>  <br>**Task 4**. A 65-year-old patient suffering from atherosclerosis developed pain in his right leg, the tissues of the first toe became edematous, black in color, the epidermis exfoliated, a discharge with an unpleasant odor appeared.<br>1. What clinical and morphological form of necrosis has developed in the patient?<br>2. What is the variety of this form?<br>3. What is the cause of this necrosis?<br>4. How to explain the black color of necrotic tissues?<br>**Answer**:<br>1. Gangrene.<br>2. Wet gangrene.<br>3. Vascular changes.<br>4. Formation of sulfurous iron |
| 3 | **Task 1.** A 56-year-old patient underwent surgery in a hospital for stomach cancer. The resected part of the stomach is sent for histological examination to the pathology department.<br>**Histological conclusion**. Adenogen gastric cancer with areas of infiltration of the muscle layer, multiple tumor emboli, tumor growth in the resection line No. 1.<br>**Questions**: 1. What material was sent for histological examination:<br>a) biopsy, b) surgical, c) surgical biopsy material.<br>2. The main importance of the study of the resected part of the stomach:<br>a) the underlying disease has been established, b) the clinical diagnosis has been confirmed,<br>c) the symptom of the disease has been established.<br>3. What other significance does this histological examination have? |

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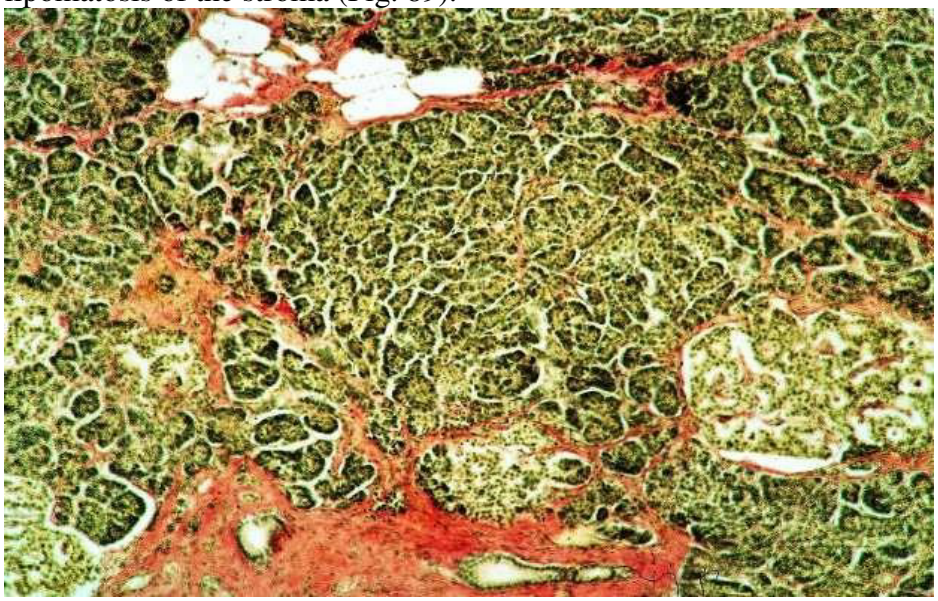
| | a) the possibility of detecting complications, b) the possibility of determining the prognosis of the disease, c) the possibility of monitoring the course of the disease,<br>d) the possibility of studying the etiology of the disease.<br>**Answers: 1) b, 2) b, 3) b**.<br>**Task 2**. **Give definition Steatosis** is the accumulation of lipids (triglycerides) in parenchymal cells. Macroscopically, the organ with steatosis is enlarged, flabby in consistency and has a yellow (ochre-yellow) color – "goose liver".<br>**Task 3. Look at the photo, describe the drug, suggest pathology**<br>Answer: Pancreas in diabetes mellitus, *stained by van Gieson. The magnification is small*<br>There is an overgrowth of connective tissue, especially pronounced around the ducts (periductal sclerosis). In addition, there is atrophy of the islets of Langerhans and lipomatosis of the stroma (Fig. 89).<br>  <br>**Task 4.** After bruising his knee, the boy developed a tumor-like growth in the area of the epiphysis of the femur. After the inpatient examination, it was decided to amputate the hip. Examination of the removed limb in the area of the lower epiphysis of the thigh revealed the growth of a tumor that destroys bone, which has no clear boundaries, gray-pink in color, on a section of the type of "fish meat".<br>1. Name the tumor?<br>2. Is it benign or malignant?<br>3. From which tissue did it develop?<br>4. Where can we expect the first tumor metastases?<br>**Answer**:<br>1. Sarcoma.<br>2. Malignant.<br>3. From the bone (osteosarcoma).<br>4. In the lungs. |
| 4 | **Task 1**. A 60-year-old man was delivered after 3 days of severe pain in the heart area. He has had a history of hypertension and widespread atherosclerosis for 20 years. After intensive 10-day treatment for acute myocardial infarction, death occurred.<br>**The following changes were found at the autopsy**. There are 400 ml of liquid blood and coagulations in the cavity of the cardiac sac. The heart weight is 520 g; the wall thickness of the left ventricle is 1.6 cm, the right one is about 2 cm. In the area of the anterior wall of the left ventricle, there is an acute transmural infarction and a linear rupture 2 cm long. Atherosclerosis of the coronary arteries (IV-4), cerebral arteries (II-2), and aorta (V-2) is pronounced. Acute venous fullness of organs and tissues.<br>**Write a pathoanatomical diagnosis and a medical death certificate**. |

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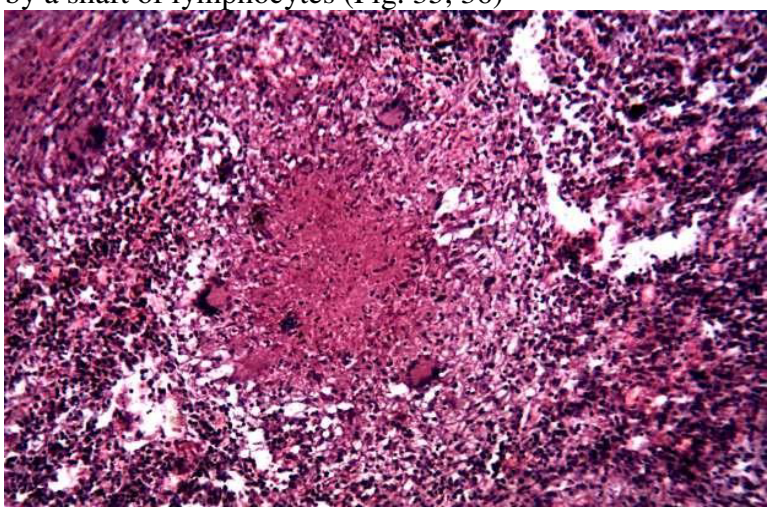
| | **Answer**: Pathoanatomical diagnosis:<br>Combined underlying disease: Coronary artery disease; acute transmural infarction of the anterior wall of the left ventricle.<br>Background disease: Arterial hypertension: heart weight 520 g, wall thickness of the left ventricle 1.6 cm.<br>Atherosclerosis: coronary arteries IV-4, cerebral arteries II-2, aorta V-2.<br>Common complications: Rupture of the heart wall in the necrosis zone.<br>Hemopericardium (400 ml).<br>Acute venous fullness of organs and tissues.<br>Medical certificate of death:<br>I a) Hematomponade<br>b) Rupture of the heart wall in the necrosis zone<br>c) Acute tranmural infarction of the anterior wall of the left ventricle<br>d)<br>II Arterial hypertension. Atherosclerosis of the coronary arteries.<br>**Task 2. Give definition Hepatosis**. This is the general name of a group of diseases based mainly on alterative changes in the liver.<br>**Task 3. Look at the photo, describe the drug, suggest pathology**<br>Answer: Miliary tuberculosis of the lung. *Stained with hematoxylin and eosin. The magnification is small*<br>Numerous tuberculous granulomas are visible in the lung tissue. In the center of the granulomas there is a focus of caseous necrosis, around it there are clusters of epithelial cells, among which there are giant multinucleated Pirogov – Langhans cells with a characteristic peripheral arrangement of nuclei in the form of a horseshoe. This is followed by a shaft of lymphocytes (Fig. 35, 36)<br>  <br>**Task 4.** The patient went to the polyclinic for severe pain in the second finger of the hand. The doctor found redness and swelling of the finger, on the terminal phalanx there is a roundish greenish focus. Upon opening the hearth, the contents of a creamy consistency were released, and a cavity was formed.<br>1. What kind of exudative inflammation has developed on the finger?<br>2. What kind of inflammation?<br>3. What is the composition of the exudate?<br>4. Why did a cavity form after the removal of the exudate?<br>**Answer**:<br>1. Purulent.<br>2. Abscess.<br>3. Polymorphonuclear leukocytes.<br>4. Purulent inflammation leads to melting of tissues |
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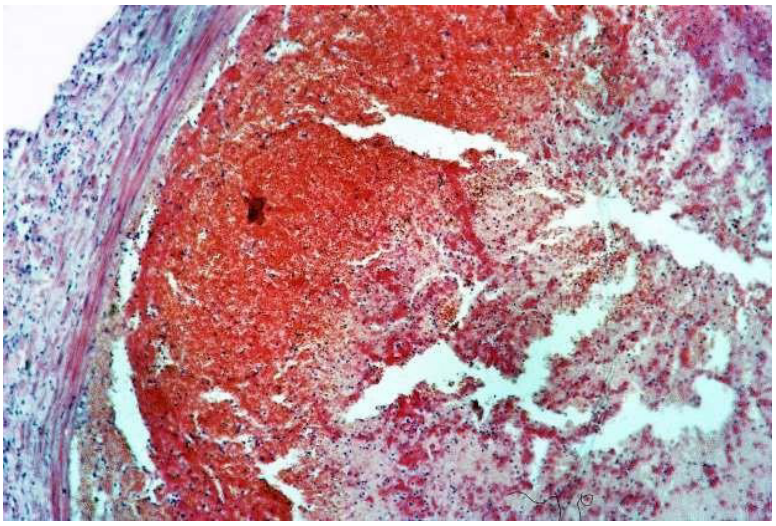
| | **Task 1**. A 60-year-old man has been suffering from hypertension for 10 years. Two years ago, he suffered a massive myocardial infarction. He was taken to the hospital after 2 days of severe pain in the heart area. On day 18, the condition worsened, ventricular fibrillation developed, which ended in cardiac arrest.<br>**The following changes were found at the autopsy**. The heart weight is 480 g, the wall thickness of the left ventricle is 1.5 cm, the right one is 0.2 cm. In the area of the posterior wall of the left ventricle there is an acute transmural infarction and a wall section with a diameter of 3.5 cm bulging outwards; in the area of the anterior wall of the left ventricle there is a field of scar tissue. Atherosclerosis of the coronary arteries (IV-3), cerebral arteries (II-2), and aorta (V-3) is pronounced. Acute venous fullness of organs and tissues.<br>**Write a pathoanatomical diagnosis and a medical death certificate**.<br>**Answer**: Pathoanatomical diagnosis:<br>Combined underlying disease: Ischemic heart disease; acute transmural infarction in the posterior wall of the left ventricle; postinfarction cardiosclerosis in the anterior wall of the left ventricle.<br>Background disease: Arterial hypertension: heart weight 480 g, wall thickness of the left ventricle 1.5 cm.<br>Atherosclerosis: coronary arteries IV-3, cerebral arteries II-2, aorta V-3.<br>Common complications: Acute aneurysm of the left ventricle of the heart.<br>Acute venous fullness of organs and tissues.<br>Medical certificate of death:<br>I a) Acute venous fullness of organs and tissues<br>b) Acute aneurysm of the left ventricle of the heart<br>c) Acute tranmural infarction of the posterior wall of the left ventricle<br>d)<br>II Arterial hypertension. Coronary atherosclerosis<br>**Task 2. Give definition**. **Rhabdomyoma** is a benign tumor developing from striated muscles.<br>**Task 3. Look at the photo, describe the drug, suggest pathology**<br>Answer: **The red blood clot**, *stained with hematoxylin and eosin. The magnification is small*<br>The lumen of the vessel is obstructed by thrombotic masses consisting of fibrin strands, platelets, a large number of red blood cells and single leukocytes. The endothelium at the site of attachment of the thrombus is broken |



**Task 4.** A patient with obesity, developed as a result of a stationary lifestyle and eating a large amount of food rich in fats and carbohydrates, complains of a feeling of heaviness in the right hypochondrium, sometimes nausea and bitterness in the mouth. An enlarged liver is palpated.

1. What process has developed in the liver?
2. What are the morphogenetic mechanisms of its development?
3. What microscopic changes can be detected in the liver punctate in this patient?
4. What color should be used to determine these changes?

**Answer**:

1. Fatty degeneration.
2. Infiltration, transformation.
3. The presence of fat droplets in the cytoplasm of hepatocytes, mainly in the peripheral lobules.
4. Sudan III