

प्रदेश लोक सेवा आयोग

गण्डकी प्रदेश

नेपाल स्वास्थ्य सेवा, प्याथोलोजी समूह जनरल प्याथोलोजी उपसमूह, नवौं (९) तहको खुला र आन्तरिक प्रतियोगितात्मक परीक्षाको पाठ्यक्रम

Paper II: Technical Subject

1. Histopathology
 - 1.1. Identify and describe the gross anatomic and microscopic alteration in the surgically removed specimens and autopsy specimens. Interpret and diagnose when clinical and operative data are provided.
 - 1.2. Explain the principles of laboratory techniques and perform the procedures in histopathology laboratory
2. Cytopathology
 - 2.1. Interpret and diagnose the morphological changes in cytological specimens when clinical and operative data are provided.
 - 2.2. Explain the principles of laboratory techniques and perform the common procedures in cytopathology laboratory.
 - 2.3. Perform fine needles aspiration techniques.
3. Hematopathology
 - 3.1. Plan a strategy for investigating haematological disorders and perform and interpret them.
 - 3.2. Perform haematological procedures and interpret the results.
 - 3.3. Interpret and diagnose the morphological changes in the blood and bone marrow specimens.
 - 3.4. Perform a bone marrow aspiration.
4. Clinical Microbiology
 - 4.1. Routine and special tests of urine, stool and body fluids
 - 4.2. Staining technique, Gram's stain, AFB stain.
 - 4.3. Aerobic and anaerobic culture and sensitivity
 - 4.4. Common serological tests.
5. Clinical Chemistry
 - 5.1. Interpretation and procedure of routine clinical chemistry tests.
 - 5.2. Equipments: Spectrophotometer, Colorimeter, Flame photometer, Blood gas analyzer, Auto analyzer.
6. Autopsy pathology
 - 6.1. Dissection of body partial/whole
 - 6.2. Preparation of provisional anatomical diagnosis and final anatomical diagnosis
7. Blood Bank
 - 7.1. Blood preservation
 - 7.2. Haematophoresis
 - 7.3. Blood grouping and cross matching
8. Immunology
 - 8.1. Basic immunology
 - 8.2. Immunological techniques used for diagnostic purpose and their principles.
9. Medical statistics and information technology

1. Histopathology

- 1.1.1. Describe the gross anatomy and histology of specimens and tissues of gastrointestinal (GIT), cardiovascular (CVS) and respiratory (RS) systems
- 1.1.2. Describe the normal physiology of above systems.

प्रदेश लोक सेवा आयोग

गण्डकी प्रदेश

नेपाल स्वास्थ्य सेवा, प्याथोलोजी समूह जनरल प्याथोलोजी उपसमूह, नवौं (९) तहको खुला र आन्तरिक प्रतियोगितात्मक परीक्षाको पाठ्यक्रम

- 1.1.3. Identify and describe the gross anatomical alterations in the surgically removed specimens
- 1.1.4. Describe the microscopic findings and diagnosis of different neoplastic lesions of above system.
- 1.1.5. Correlate the gross and microscopic pathological diagnosis of the lesions of above system with the given clinical information.
- 1.1.6. Explain different types and functions of fixatives in histopathology laboratory.
 - a) Special fixatives for special tests like electron microscopy, immunofluorescence.
- 1.1.7. Explain different types of chemicals, and equipment used in tissue processing and perform the procedure.
 - a) Decalcifying reagents
 - b) Histokinets and tissue processing
 - c) Microtomy
- 1.1.8. Explain the steps and principles of different stains.
 - a) H&E stains
 - b) PAS stains
 - c) Reticulin stains
- 1.1.9. Interpret the principles and different IHC for diagnosing difficult cases
 - a) Epithelial markers like Cytokeratin, EMA
 - b) Neuroendocrine markers
 - c) Lymphoid markers
 - d) Vascular markers
- 1.1.10. Recall the biochemical changes in a tissue or organ in above mentioned conditions.
- 1.1.11. Diagnose the above mentioned lesions and differentiate them from other similar lesions in view of the clinical findings provided.
- 1.1.12. Describe the gross anatomy and histology of specimens and tissues of renal electrolytes, endocrine and reproductive systems.
- 1.1.13. Describe the normal physiology of renal electrolytes and reproductive systems.
- 1.1.14. Describe metabolism of carbohydrate, fat protein, nucleic acids, vitamins, copper and minerals.
- 1.1.15. Identify and describe the gross anatomical alterations in the surgically removed specimen of renal electrolytes, endocrine and reproductive systems.
- 1.1.16. Correlate the gross pathological diagnosis of the lesions of renal electrolytes, endocrine and reproductive systems with clinical data.
- 1.1.17. Interpret the microscopic findings of various neoplastic and non neoplastic lesions of renal electrolyte reproductive system and endocrine system.
- 1.1.18. Diagnosis and differentiation with various other lesions of above mentioned system.
- 1.1.19. Describe the gross anatomy and histology of specimen and tissues from musculoskeletal system, neuro sensory systems, eye, ENT and skin.
- 1.1.20. Describe the normal physiology of the above mentioned systems.
- 1.1.21. Describe the gross diagnosis in the surgically removed specimen of above mentioned systems.
- 1.1.22. Correlate the gross findings, microscopic features with diagnosis and clinical presentations.
- 1.1.23. Explain the use of museum and importance of preservation of specimens.
 - a) Maintenance of museum
 - b) Mounting specimens in museum

प्रदेश लोक सेवा आयोग

गण्डकी प्रदेश

नेपाल स्वास्थ्य सेवा, प्याथोलोजी समूह जनरल प्याथोलोजी उपसमूह, नवौं (९) तहको खुला र आन्तरिक प्रतियोगितात्मक परीक्षाको पाठ्यक्रम

1.2. Frozen Section

1.2.1. Describe the principle and application of cryostat.

1.2.2. Perform frozen section of intraoperative specimens and diagnose.

2. Cytopathology

2.1. Describe the normal cell morphology in vaginal, cervical and endometrial specimens

2.2. Prepare the above mentioned smears, fix and stain with Pap staining.

a) Principle and steps of PAP staining

b) Differences between PAP and Giemsa stain

2.3. Describe different types of fixatives used in cytopathological laboratory and explain their functions.

2.4. Perform fine needle aspiration biopsy procedure, prepare wet and dry smears fix and stain the slides with Pap stain and Giemsa stain.

2.5. Explain the principle and steps of staining by Giemsa stain.

2.6. Interpret the cellular morphological changes in sputum, vaginal, cervical and endometrial specimen and neoplastic conditions.

2.7. Interpretation of cervical smears based on Bethesda system of classification.

2.8. Describe the different methods of preparing smears from body fluids including urine and CSF.

a) Barbotage Urine Processing

2.9. Describe the principles of cytocentrifuge and Millipore filtration.

2.10. Describe the normal cell morphology in brushing, washing and body fluids smears.

2.11. Interpret the cellular morphological changes in brushing, washing and body fluid smears in different inflammatory, non-inflammatory, non-neoplastic and neoplastic conditions.

2.12. Correlate the findings with the clinical findings and diagnose them.

2.13. Explain sex chromatin. Describe the methods of obtaining and preparation of smears for the examination of sex chromatin.

2.14. Describe few diseases with autosomal disorders.

2.15. Describe the congenital anomalies in relation to sex chromosome.

2.16. Interpret FNAC smears and diagnose the lesions.

3. Haematopathology

3.1. Explain the normal hematopoiesis.

3.2. Describe the erythropoiesis.

3.3. Describe the structure, function, synthesis and metabolism of haemoglobin.

3.4. Classify the different types of Anaemias. (Etiological and Morphological classification)

3.5. Explain the morphological findings in the peripheral and bone marrow smears in different types of anaemia and correlate with clinical data and diagnose correctly.

3.6. Perform routine as well as the following haematological tests and explain their principle:

3.6.1. Reticulocyte count

3.6.2. Osmotic fragility test

3.6.3. Foetal haemoglobin

3.6.4. LE cell phenomenon

3.6.5. Hb electrophoresis

3.6.6. Serum Iron, Folic acid, Vit B₁₂

3.6.7. Total Iron binding capacity

3.6.8. Serum ferritin

प्रदेश लोक सेवा आयोग

गण्डकी प्रदेश

नेपाल स्वास्थ्य सेवा, प्याथोलोजी समूह जनरल प्याथोलोजी उपसमूह, नवौं (९) तहको खुला र आन्तरिक प्रतियोगितात्मक परीक्षाको पाठ्यक्रम

- 3.7. Perform a fine needle bone marrow aspiration and stain with Wright's stain.
- 3.8. Interpret and diagnose the morphological changes in the blood and bone marrow specimen.
- 3.9. Perform the common haematological procedures and interpret the results.
- 3.10. Perform cytochemical test and interpret.
- 3.11. Classify Leukaemia (FAB classifications of Acute leukemia) Identify different types and their morphological features
- 3.12. Explain different types of coagulopathies.
- 3.13. Explain principles and interpretation of
 - 3.13.1. Bleeding time
 - 3.13.2. Clotting time
 - 3.13.3. Prothrombin time
 - 3.13.4. Activated partial thromboplastine time
 - 3.13.5. Platelet function test
 - 3.13.6. Factor VII and IX Assay
 - 3.13.7. Bence Jones protein
- 3.14. Plan a strategy of investigations for common bleeding and coagulation disorders.

4. Clinical Microbiology

- 4.1. Perform the routine examination of urine and faeces and interpret the findings correctly.
- 4.2. Perform complete examination of CSF: TC, DC, Protein, Sugar, ADA and LDH
- 4.3. Perform examination of blood for blood parasites.
 - a) Malarial parasites
 - b) Filariasis
 - c) LD bodies in Bone marrow examination
- 4.4. Semen analysis
- 4.5. Identify the common aerobic and anaerobic bacteria in a culture plate.
- 4.6. Perform the Gram's stain and identify the common bacteria.
- 4.7. Perform sensitivity reactions of common bacteria.
- 4.8. Explain the principle of Gram's stain and ZN stain.
- 4.9. Explain the importance of collection of specimens of culture.
- 4.10. Explain principle of HbSAg, HIV tests.

5. Clinical Chemistry

- 5.1. Perform and interpret correctly the routine clinical chemistry tests.
- 5.2. Explain the working principles of spectrophotometer, colorimeter, flame photometer, blood gas analyzer, electrophoresis and automation in laboratory medicine.

6. Autopsy pathology

- 6.1. Perform a complete/partial autopsy.
- 6.2. Identify the gross and microscopic features found in autopsy body and tissue sections respectively and correlate it with clinical history and diagnosis.
- 6.3. Write the provisional and final anatomical diagnosis reports correctly.

7. Blood Bank

- 7.1. Perform blood grouping, Rh typing tests and cross matching.
- 7.2. Perform Coombs test (Direct and indirect)
- 7.3. Explain the principles and interpretations of above tests.

8. Immunology

- 8.1. Observe and interpret simple immunological tests eg:
 - 8.1.1. Agar Gel precipitation

प्रदेश लोक सेवा आयोग

गण्डकी प्रदेश

नेपाल स्वास्थ्य सेवा, प्याथोलोजी समूह जनरल प्याथोलोजी उपसमूह, नवौं (९) तहको खुला र आन्तरिक प्रतियोगितात्मक परीक्षाको पाठ्यक्रम

- 8.1.2. Haemagglutination
- 8.1.3. Immunoelectrophoresis
- 8.1.4. Identification of T and B cells in peripheral blood
- 8.1.5. Immuno Fluorescence technique
- 8.1.6. RT-PCR tests
- 8.1.7. ELISA techniques.
- 8.1.8. Explain the principle lying behind these tests.
- 8.1.9. Explain the principle of fluorescent microscopy.

9. Medical statistics and information technology

- 9.1. Explain the importance of statistical methods in assessing data from patient material and experimental studies, correlation coefficient, expected versus observed and their interpretations.
- 9.2. Calculate mean, standard deviation and standard error from given experimental data.
- 9.3. Familiarity with the use of the computer and other telecommunication devices like the fax for the storage, retrieval and sending of information.
- 9.4. Search for information in the Internet by electronic mail.