

प्रदेश लोक सेवा आयोग

सुदूरपश्चिम प्रदेश

प्रदेश निजामती सेवा र स्थानीय सरकारी सेवा अन्तरगत स्वास्थ्य सेवा, मेडिकल ल्याव टेक्नोलोजी समूह, जनरल मेडिकल ल्याव टेक्नोलोजी उपसमूह, नवौं तह वा सो सरह पदको खुला, अन्तर तह र आन्तरिक प्रतियोगितात्मक परीक्षाको पाठ्यक्रम

यस पाठ्यक्रम योजनालाई निम्न अनुसार दुई चरणमा विभाजन गरिएको छ :

प्रथम चरण (First Phase) : लिखित परीक्षा (Written Examination)

पूर्णांक : २००

द्वितीय चरण (Second Phase) : अन्तरवार्ता (Interview)

पूर्णांक : २५

परीक्षा योजना (Examination Scheme)

प्रथम चरण : लिखित परीक्षा (Written Examination)

पूर्णांक : २००

पत्र	विषय	खण्ड	पूर्णांक	उत्तीर्णांक	परीक्षा प्रणाली		प्रश्न संख्या × अंक	समय
प्रथम	General Subjects	(क)	50	40	Subjective	Short Answer	6 x 5	3.00 hrs.
		Management				Long Answer	2 x 10	
		(ख)	50		Subjective	Short Answer	4 x 5	
		General Health Issues				Long Answer	3 x 10	
द्वितीय	Technical Subject		100	40	Subjective	Critical Analysis	4 x 15	3.00 hrs.
					Subjective	Problem Solving	2 x 20	

द्वितीय चरण : अन्तरवार्ता (Interview)

पूर्णांक : २५

द्रष्टव्य :

- लिखित परीक्षाको माध्यम भाषा नेपाली वा अंग्रेजी अथवा नेपाली र अंग्रेजी दुबै हुन सक्नेछ ।
- स्वास्थ्य सेवा अन्तरगतका सबै समूह/सबै उपसमूहहरूको लागि प्रथम पत्र को पाठ्यक्रमको विषयवस्तु एउटै हुनेछ । तर द्वितीय पत्र Technical Subject को पाठ्यक्रम समूह/उपसमूह अनुरूप फरक फरक हुनेछ ।
- प्रथम पत्र को लिखित परीक्षा समूह/उपसमूहहरूका लागि संयुक्त रूपमा एउटै प्रश्नपत्रबाट एकैदिन वा छुट्टाछुट्टै प्रश्नपत्रबाट छुट्टाछुट्टै दिन पनि हुन सक्नेछ । तर द्वितीय पत्र को परीक्षा समूह/उपसमूह अनुसार अलग अलग दिन छुट्टाछुट्टै प्रश्नपत्रबाट हुनेछ ।
- प्रथम पत्रको खण्ड (क) र खण्ड (ख) को लागि छुट्टाछुट्टै उत्तरपुस्तिका हुनेछन । (खण्ड - क को लागि एउटा र खण्ड - ख को लागि एउटा) भने द्वितीय पत्रको लागि प्रत्येक प्रश्नका उत्तरपुस्तिकाहरू छुट्टाछुट्टै हुनेछन् ।
- यस पाठ्यक्रममा जे सुकै लेखिएको भएता पनि पाठ्यक्रममा परेका ऐन, नियम तथा नीतिहरू परीक्षाको मिति भन्दा ३ महिना अगाडि संशोधन भएका वा संशोधित भई कायम रहेका वा थप गरी संशोधित भई कायम रहेका लाई यस पाठ्यक्रममा परेको सम्झनु पर्दछ ।
- प्रथम चरणको लिखित परीक्षाबाट छनौट भएका उम्मेदवारहरूलाई मात्र द्वितीय चरणको अन्तर्वार्तामा सम्मिलित गराइने छ ।
- पाठ्यक्रम लागु मिति : २०८१।११।०१ गते देखि ।

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प्रथम पत्र : General Subject
(Management and General Health issues)

खण्ड – (क) : 50 Marks
(Management)

1. Management : concept, principles, functions, scope, role, level and skills of managers
2. Hospital management
3. Participative management : concept, advantages and disadvantages, techniques of participation
4. Time management : concept, advantages, and disadvantages
5. Conflict management : concept, approaches to conflict, levels of conflict, causes of conflict and strategies for conflict management, Negotiation skills
6. Stress management : concept, causes and sources of stress, techniques of stress management
7. Appreciative inquiry : concept, basic principles and management
8. Human resource management : concept, functions and different aspects, HRM strategy
9. Planning : concept, principles, nature, types, instrument and steps, logical framework
10. Financial management : concept, approaches, budget formulation and implementation, auditing and topics related to fiscal management, procurement, supply chain management, e-LMIS
11. Leadership : concept, functions, leadership styles, leadership and management effectiveness
12. Coordination : concept, need, types, techniques, and approaches of effective coordination
13. Communication : concept, communication process and barrier to effective Communication, techniques for improving communication
14. Health manpower recruitment and development
15. Organizational structure of Federal, provincial health related ministry
16. Governance : Good governance system in Health Sector
17. Health system, WHO Six Building blocks
18. Sudurpashchim Province Civil Service Act and Regulation
19. Procurement Act, 2063 & Sudurpashchim Pradesh Procurement Regulation, 2078
20. Sudurpashchim Pradesh Good Governance Act, 2075

ΩΩΩ

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खण्ड – (ख) : 50 Marks

(General Health Issues)

1. The Constitution of Nepal (health and welfare issues)
2. National and Provincial Health Policy and Public Health Act
3. Health Sector in current 5 year Sudurpashchim provincial plan
4. Health Services Act 2053, Health Service Regulation, 2055
5. International Health Agencies: multilateral, bilateral, NGOs/INGOs working in Sudurpashchim province
6. Health related Professional Council and related regulations
7. Medical ethics in general and its application
8. Indigenous and traditional faith healing and health mal-practices in context of Sudurpashchim Province
9. Supervision, types and its usage in health sector
10. Monitoring and evaluation system in health sector
11. Health Management Information System
12. Social Health insurance, health care financing and concept of co-payment
13. Importance of water, sanitation and hygiene in public health
14. Disaster and emergency management in health sector, HOPE
15. Effect of environment in public health: air pollution, water pollution, soil and noise pollution
16. FCHVs involvement in health service delivery
17. Community involvement in health service delivery
18. Counseling: - concept, type, importance and its application in health service delivery
19. Cross cutting issues: - GESI, Climate change, health in all policy

ΩΩΩ

द्वितीय पत्र (Second Paper)

Technical Subject

1. Hematology

(15 Marks)

- 1.1. Formation, composition and function of blood
- 1.2. Collection and preservation of blood for various hematological investigations
- 1.3. Hemoglobinometry, various methods of estimation of hemoglobin, errors involved and standardization of instrument
- 1.4. Romanowsky dyes, preparation and staining procedures for all counts, visual as well as electronic method and errors involved and means to minimize such errors in counting red blood cells, white blood cells and platelets.
- 1.5. Anemia: Definition, classification and clinical features and causes of various types of anemia
- 1.6. Laboratory investigations for various types of anemia.
- 1.7. LE cell phenomenon and various methods of its demonstration
- 1.8. Principle procedure and interpretation of Coomb test.
- 1.9. Leukocyte abnormalities and pathological variations of white cell values
- 1.10. Leukemoid reactions and its importance.
- 1.11. Haemostatic mechanism and theories of blood coagulation.
- 1.12. Physico chemical properties of coagulation factors.
- 1.13. Routine test as well as the following Haematological tests and their Principle and interpretation of:
 - 1.13.1. Reticulocyte count
 - 1.13.2. Osmotic fragility test
 - 1.13.3. Foetal hemoglobin
 - 1.13.4. LE cell phenomenon
 - 1.13.5. Hb electrophoresis
 - 1.13.6. Serum Iron, Folic acid, Vit B12.
 - 1.13.7. Total Iron binding capacity
 - 1.13.8. Serum ferritin
 - 1.13.9. BT, CT, PT, APTT
 - 1.13.10. Factor VIII and IX
 - 1.13.11. Platelet function test
 - 1.13.12. Bence Jones protein
- 1.14. Classify Leukemia
- 1.15. Identify different types of leukemia and their morphological features

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2. Microbiology

(35 Marks)

- 2.1. Historical development of microbiology with reference to Anton Van Leuwenhoek, Louis Pasteur, Robert Koch, Joshep Lister, Edward Jenner
 - 2.1.1. Bacterial Classification, Morphology and Cell structure
 - 2.1.2. Laboratory contamination and infection, Disposal of infectious material, laboratory safety measure, laboratory discipline and practices.
 - 2.1.3. Different ways of sterilization by Physical, chemical, radiation and filtration and its applications. Relationship between disinfectants and antiseptics, disinfection rate of microorganisms and uses of ethylene oxide sterilizer
 - 2.1.4. Mechanism, functions, uses and the quality control of the laboratory equipments.
 - 2.1.5. Classify the types of antigen antibody reactions, hypersensitivity, immediate and delayed.
 - 2.1.6. Morphology, staining property, cultural characteristics, Biochemical reaction, Antigenic Characters, Pathogenicity, Laboratory diagnosis and the diseases caused by the followings:
 - 2.1.6.1. Gram positive cocci: Staphylococci, streptococci, Pneumococci, Micrococci
 - 2.1.6.2. Gram Positive bacilli: Corynebacteria, bacillus; clostridia
 - 2.1.6.3. Gram negative bacilli (Enterobacteriaceae): Escherichia coli, Klebsiella, Enterobacter, Citrobacter, Proteus, Providencia, Yersinia, Salmonella, Shigella, Arizona
 - 2.1.6.4. Gram negative cocci: Neiseria
 - 2.1.6.5. Curve Gram negative bacilli: Vibrio, Campylobacter, helicobacter
 - 2.1.6.6. Mycobacteria: Typical and Atypical mycobacteria, Leprosy
 - 2.1.6.7. Haemophilus: H. Influenzae and other species
 - 2.1.6.8. Non fermentative Gram negative bacilli: Pseudomonas, Acinetobacter, Moraxella
 - 2.1.6.9. Spirochaete; Treponema, Borrelia, Leptospira
 - 2.1.6.10. Miscellaneous fastidious organisms: Mycoplasma, Chlamydia, Rickettsia
 - 2.1.7. Antigen Antibody reaction; agglutination, precipitation flocculation, complement fixation and ELISA.
 - 2.1.8. Bacteriological examination: Water, milk, food, air and pharmaceutical products.
 - 2.1.9. Procedure of:
 - 2.1.9.1. Laboratory diagnosis of common Bacterial infection; Pyogenic Infection; Respiratory tract infection, urinary tract infection, sexually transmitted diseases, food poisoning, enteric fever, gastroenteritis, meningitis, diphtheria, tuberculosis, leprosy.
 - 2.1.10. Diagnostic procedure immunological/serological test, Widal tests, ASO titer, CRP, Rose – Walter test; Brucella agglutination, cold agglutination, VDRL, RPR, TPHA, ELISA, CFT.
 - 2.1.11. Methods of separation of T and B Cells

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2.2. Bacteriology (procedure):

- 2.2.1. Collection of specimens for bacteriological specimens
- 2.2.2. Methods of culture techniques and organisms encountered in CSF, Blood culture, Sputum, Pus, Urine, Stool, Body fluid aspirate etc.
- 2.2.3. Quality control in procedure, culture media, equipments
- 2.2.4. Hospitals infection, Laboratory infection
- 2.2.5. Infectious waste management

2.3. General Virology:

- 2.3.1. General properties of viruses and interferon
- 2.3.2. Principle of viral isolation, embryonated egg and tissue culture
- 2.3.3. Immunology of viral infection

2.4. Mycology:

- 2.4.1. Identification of superficial, deep and systemic mycosis
- 2.4.2. Opportunistic mycosis
- 2.4.3. Examination and identification by different method and culture

2.5. Parasitology

- 2.5.1. Classification of human and vectors
- 2.5.2. General characteristics of Protozoa, Helminthes, trematodes/cestodes
- 2.5.3. Methods of collection, transportation and storage of different types of specimens
- 2.5.4. Methods of identification parasites from different types of clinical materials

2.6. Immunology

- 2.6.1. Immune system and infectious diseases
- 2.6.2. Structure, types and function of Immunoglobulin
- 2.6.3. Toxin/antitoxin and antibody/antigen reaction and their various types
- 2.6.4. Immunological reaction and their various types; agglutination, precipitation, complement fixation, ELISA
- 2.6.5. Preparation, preservation and titration of complement
- 2.6.6. T cells and B cells
- 2.6.7. Monoclonal and polyclonal antibodies preparation

2.7. Systematic Bacteriology

- 2.7.1. Properties, epidemiology, methods of isolation, differentiation, pathogenesis and Laboratory diagnosis of following bacterial infections:
Staphylococcus, Streptococcus, Pneumococcus, Neisseria, Corynebacteria, Bacillus, Clostridium, nonsporing anaerobes, Enterobacteriaceae, Vibrio, Pseudomonas, Yersinia, Pasteurella, Francisella, Haemophilus, Bordetella, Mycobacterium, Spirochaetes, Mycoplasma, Actinomycetes, Rickettsia, Chlamydiae.

3. Biochemistry

(35 Marks)

3.1. Total Quality Management in Laboratory Medicine

- 3.1.1. Fundamental of Total Quality Management
- 3.1.2. Statistical process in quality control
- 3.1.3. Method evaluation
- 3.1.4. Element of quality assurance program
- 3.1.5. Type of pre-analytical variables and its control
- 3.1.6. Control of analytical variables
- 3.1.7. Selection of QC materials
- 3.1.8. Frequency of assay for QC materials
- 3.1.9. Quality control chart-LJ Chart, operating specification chart, Cusum chart, shewhart chart
- 3.1.10. Rule to evaluate QC results- Westgard multirule concept
- 3.1.11. Post-analytical variables in laboratory
- 3.1.12. Calibration issue in Quality control
- 3.1.13. Quality control using patient data
- 3.1.14. Standard operating procedure
- 3.1.15. Monitoring Technical competence
- 3.1.16. Errors and identification of the source of error in laboratory
- 3.1.17. External quality control and proficiency testing (PT)
- 3.1.18. Accreditation in laboratory medicine

3.2. Basic Biochemistry

- 3.2.1. Principle of Biochemistry
- 3.2.2. Buffer: Definition, types, composition of buffer present in body fluids
- 3.2.3. Photometric measurement of light i.e. radiant energy, spectrum characteristics i.e. UV and IR, Beer's law and Lambert's law and their limitations and to select the multiple wave length i.e. single and double beams.

3.3. Metabolism

3.3.1. Carbohydrate

- 3.3.1.1. Glycolysis
- 3.3.1.2. Glycogenesis
- 3.3.1.3. Glycogenolysis
- 3.3.1.4. Pentose phosphate pathway
- 3.3.1.5. Kreb's cycle
- 3.3.1.6. Gluconeogenesis
- 3.3.1.7. Electron transfer chain (Respiratory chain)

3.3.2. Protein metabolisms

- 3.3.2.1. Transamination
- 3.3.2.2. Deamination

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- 3.3.2.3. Urea cycle
- 3.3.2.4. Nitrogen balance
- 3.3.2.5. Creatinine and creatinine formation
- 3.3.2.6. Biochemical basis, investigation and interpretation of aromatic amino acid metabolism disorder
- 3.3.3. **Lipid metabolisms**
 - 3.3.3.1. Biochemical basis of formation of bile acid/bile salts.
 - 3.3.3.2. Biosynthesis, biochemical effect of prostaglandin and other arachinodic acid metabolism
 - 3.3.3.3. Use of prostaglandin and their inhibitors in medicine
 - 3.3.3.4. Ketogenesis and its regulation and transportation
 - 3.3.3.5. Biochemical changes leading to ketosis, utilization of ketone bodies.
 - 3.3.3.6. Biosynthesis of cholesterol and triglyceride (TG)
 - 3.3.3.7. Dyslipidemia and laboratory investigation
 - 3.3.3.8. Introduction, classification, definition and types of lipoprotein
- 3.4. **Liver Function Test**
 - 3.4.1. Function of liver and bilirubin metabolism
 - 3.4.2. Liver function test and their list with principle, procedures and interpretations
 - 3.4.3. Biochemical investigation in acute and chronic liver disease
- 3.5. **Kidney function test**
 - 3.5.1. Anatomy and physiology of kidney
 - 3.5.2. Function of kidney i.e. excretory, Secretion, re-absorption
 - 3.5.3. Renal function test, their list with principle, procedure and interpretation
 - 3.5.4. Biochemical investigation in acute and kidney disease, nephritic syndrome
 - 3.5.5. Creatinine clearance test (principle procedure and interpretation).
- 3.6. **Pancreatic Function test**
 - 3.6.1. Anatomy and physiology of pancreas
 - 3.6.2. Pancreatic function test, their list and clinical significance of - Serum amylase, Urine amylase, Serum lipase, Serum trypsin, Phospholipase, Hyperglycaemia, Hypoglycaemia
- 3.7. **Cardiac Function test**
 - 3.7.1. Biochemical basis, investigation and interpretation of myocardial infarction (MI)
 - 3.7.2. Estimation and interpretation of
 - 3.7.2.1. LDH
 - 3.7.2.2. CPK
 - 3.7.2.3. GOT
 - 3.7.2.4. Troponin
 - 3.7.2.5. CPK MB

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3.8. Acid Base and Electrolyte

- 3.8.1. pH, buffer and blood gas analysis and interpretation
- 3.8.2. Acid base regulation and its disorders
- 3.8.3. Water and electrolyte Imbalance and measurement of electrolytes

3.9. Endocrinology

- 3.9.1. Thyroid Function Tests,
- 3.9.2. Pituitary Function Test
- 3.9.3. Reproductive Hormone Test and investigation in infertility
- 3.9.4. Hormonal regulation of calcium and phosphorous metabolism
- 3.9.5. Hormonal regulation of blood glucose level
- 3.9.6. Laboratory investigation in Diabetes mellitus
- 3.9.7. Adrenal Function test

3.10. Tumor Marker

- 3.10.1. Estimation and interpretation of AFP, B-hCG, CEA, CA-125, CA 19-9, CA 15-3, PSA

3.11. Enzyme

- 3.11.1. Definition, classification and properties of enzyme
- 3.11.2. Factor affecting enzymatic activity
- 3.11.3. Mechanism of enzymatic activity
- 3.11.4. Regulation of enzymatic activity
- 3.11.5. Isoenzyme and clinical application of enzyme assessment
- 3.11.6. Clinical importance and estimation of (SGPT, SGOT, ALP, GGT, ACP, CK, CK-MB, LDH, Amylase, Lipase.

3.12. Serum Protein, Lipoprotein and Hemoglobin Electrophoresis

3.13. Recent advances in clinical biochemistry.

3.14. Management of Biochemistry Laboratory

4. Histopathology and Cytology

(15 Marks)

- 4.1. Fixatives and preservatives, their types, composition and methods of preparations
- 4.2. Different types of decalcifying agents, their principle and mode of decalcification
- 4.3. Special histological stains, their composition and principle of Haematoxylin, eosin and special stain for connective tissue, protein, amyloid, carbohydrate, lipid and pigments
- 4.4. Principle and application of immunohistochemistry
- 4.5. Immunofluorescence technique
- 4.6. Electron Microscopic and its applications
- 4.7. Safety measures and quality assurance in Histopathology Laboratory
- 4.8. Cytology of the respiratory tract: Introduction to respiratory tract, various methods of sample collection, different methods of staining the collected samples and special stains used in the diagnosis of the diseases.

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सुदूरपश्चिम प्रदेश

प्रदेश निजामती सेवा र स्थानीय सरकारी सेवा अन्तरगत स्वास्थ्य सेवा, मेडिकल ल्याव टेक्नोलोजी समूह, जनरल मेडिकल ल्याव टेक्नोलोजी उपसमूह, नवौं तह वा सो सरह पदको खुला, अन्तर तह र आन्तरिक प्रतियोगितात्मक परीक्षाको पाठ्यक्रम

- 4.9. Gynecological cytology: Introduction to the female genital tract, various methods of sample collection and different methods of staining. Features of various malignant, benign and infective specimens, stains and special stains used.
- 4.10. Cytology of body fluids and urine: Introduction, methods of sample collection, various methods of staining body fluid samples and urinary cytology.
- 4.11. Cerebrospinal fluid (CSF): Introduction, staining, cytological study and its applications.
- 4.12. Sex chromatin, Chromosomal Analysis and Karyotyping: Introduction, methods of staining and its applications.
- 4.13. Uses of Cytogenetics, Flowcytometry and Polarized microscopy in cytological study
- 4.14. Role of automation in cytology
- 4.15. Method of project writing and its importance

द्वितीय पत्रका एकाईहरुबाट निम्नानुसार प्रश्नहरु सोधिनेछ ।

द्वितीय पत्रका एकाई	1-Hematology	2-Microbiology		3-Biochemistry		4-Histopathology & Cytology
प्रश्न संख्या	1	1	1	1	1	1
अंकभार	15	15	20	15	20	15

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