

पाटन स्वास्थ्य विज्ञान प्रतिष्ठान सेवा आयोग
 प्राविधिक सेवा, ल्याव समूह, ल्याव सुपरभारजर पद, तह ९(क) को
 खुला तथा आन्तरिक प्रतियोगितात्मक परीक्षाको पाठ्यक्रम
 एवं परीक्षा योजना

यस पाठ्यक्रम योजनालाई दुई चरणमा विभाजन गरिएको छ :

प्रथम चरण :- लिखित परीक्षा(Written Examination)

पूर्णाङ्क :- २००

द्वितीय चरण :-अन्तर्वार्ता (Interview)

पूर्णाङ्क :- ३०

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

Paper	Subject		Marks	Full Marks	Pass Marks	No. Questions & Weightage		Time Allowed
I	General Subject	Part I: Management, General Health Issues, Professional behaviour and Assessment and Evaluation Practices	50	100	40	10 × 5 = 50 (Subjective)	1.30 hrs	2.15 hrs
		Part II: Technical Subject (Relevant Subject)	50			50 × 1 = 50 (Objective Multiple Choice)	45 min	
II	Technical Subject (Relevant Subject)			100	40	7 × 10 = 70 (Long answer) 2 × 15 = 30 (Critical Analysis)		3.00 hrs
द्वितीय चरण(Second Phase)								
	Interview				30		Oral	

द्रष्टव्य :

- लिखित परीक्षाको माध्यम भाषा नेपाली वा अंग्रेजी अथवा नेपाली र अंग्रेजी दुवै हुन सक्नेछ ।
- प्रतिष्ठानको प्राज्ञिक सेवा अन्तर्गतका सबै समूह/सबै उपसमूहहरूको लागि प्रथमपत्रको Part I को पाठ्यक्रमको विषयवस्तु एउटै हुनेछ । तर प्रथमपत्रको Part II र द्वितीयपत्र Technical Subject को पाठ्यक्रम समूह/उपसमूह अनुरूप फरक फरक हुनेछ ।
- प्रथम र द्वितीयपत्रको लिखित परीक्षा छुट्टाछुट्टै हुनेछ । प्रथमपत्रको Part II र द्वितीयपत्रको विषयवस्तु एउटै समूहको हकमा समान हुनेछ । परीक्षामा सोधिने प्रश्नसंख्या र अङ्कभार यथासम्भव सम्बन्धित पत्र, विषयमा दिईए अनुसार हुनेछ ।
- वस्तुगत बहुवैकल्पिक (Multiple Choice) प्रश्नहरूको गलत उत्तर दिएमा प्रत्येक गलत उत्तर बापत २० प्रतिशत अङ्क कट्टा गरिनेछ । तर उत्तर नदिएमा त्यस बापत अङ्क दिइने छैन र अङ्क कट्टा पनि गरिने छैन ।
- वस्तुगत बहुवैकल्पिक हुने परीक्षामा परीक्षार्थीले उत्तर लेख्दा अंग्रेजी ठूलो अक्षर (Capital letter) A,B,C,D मा लेख्नुपर्नेछ । सानो अक्षर (Small letter) a, b, c, d लेखेको वा अन्य कुनै सङ्केत गरेको भए सबै उत्तरपुस्तिका रद्द हुनेछ ।
- बहुवैकल्पिक प्रश्नहरू हुने परीक्षामा कुनै प्रकारको क्याल्कुलेटर (Calculator) प्रयोग गर्न पाइने छैन ।
- विषयगत प्रश्नहरूको हकमा एउटै प्रश्नका दुई वा दुई भन्दा बढी भाग (Two or more parts of a single question) वा एउटा प्रश्न अन्तर्गत दुई वा बढी टिप्पणीहरू (Short notes) सोध्न सकिने छ ।
- विषयगत प्रश्नमा प्रत्येक पत्र/विषयका प्रत्येक खण्डका लागि छुट्टाछुट्टै उत्तरपुस्तिकाहरू हुनेछन् । परीक्षार्थीले प्रत्येक खण्डका प्रश्नहरूको उत्तर सोही खण्डका उत्तरपुस्तिकामा लेख्नुपर्नेछ ।
- यस पाठ्यक्रम योजना अन्तर्गतका पत्र/विषयका विषयवस्तुमा जेसुकै लेखिएको भएतापनि पाठ्यक्रममा परेका कानून, ऐन, नियम, विनियम तथा नीतिहरू परीक्षाको मिति भन्दा ३ महिना अगाडि (संशोध नभएका वा संशोध नभई हटाईएका वा थप गरी संशोध नभई) कायम रहेकालाई यस पाठ्यक्रममा परेको सम्झनु पर्दछ ।
- प्रथम चरणको परीक्षाबाट छनौट भएका उम्मेदवारहरूलाई मात्र द्वितीय चरणको परीक्षामा सम्मिलित गराइनेछ ।
- पाठ्यक्रम लागू मिति : २०७९/१२/२९

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Paper I: General Subject

Part I:
(Management, General Health Issues, Professional behaviour and Assessment and Evaluation Practices)

Section (A) - 25 Marks

1. Management

- 1.1. Health care management system in Nepal and other parts of the world
- 1.2. Fundamental principles of healthcare institution and hospital management.
- 1.3. Effective hospital management principles
- 1.4. Purpose of medical and non-medical data and records
- 1.5. Ethics and responsibility of management
- 1.6. Concept of management and its application in health care including hospital
 - 1.7.1 Management: Concept, principles, functions, scope and role, level and skills of manager
 - 1.7.2 Planning: Concept, principles, nature, types, instruments and steps
 - 1.7.3 Leadership: Concept, function, leadership styles, leadership and management
 - 1.7.4 Coordination: Concept, types, techniques of effective coordination
 - 1.7.5 Communication and counselling: Concept, communication processes and barrier to effective communication, techniques for improving communication
 - 1.7.6 Decision making: Importance, types, rational process of decision making, problem solving techniques, improving decision making
 - 1.7.7 Participative management: Concept, advantage and disadvantage, techniques of participation
 - 1.7.8 Time management: Concept, essential factors and strategies for effective time management
 - 1.7.9 Conflict management: Concept, approaches to conflict, levels of conflict, causes of conflict and strategies for conflict management
 - 1.7.10 Stress management: Concept, causes and sources of stress, techniques of stress management
 - 1.7.11 Change management: Concept, sources of organizational change, resistance to change, management of resistance to change
 - 1.7.12 Appreciative inquiry: Concept, basic principle and management
 - 1.7.13 Human resource management: Concept, functions and different aspects
 - 1.7.14 Health manpower recruitment and development
 - 1.7.15 Financial management: Concept, approaches, budget formulation and implementation, Auditing and topics related to fiscal administration

2. General Health Issues

- 2.1. Present constitution of federal republic of Nepal (including health and welfare issues)
- 2.2. Organizational structure of Ministry of Health at national/federal, regional/state, district (if applicable), municipal and village council level
- 2.3. Professional council and related regulations
- 2.4. National Health Policy
- 2.5. Health Service Act and Regulation
- 2.6. Second Long term health plan
- 2.7. Health Management Information System, forms, indicators, annual reports
- 2.8. Human Development Indices, Sustainable Development Goals
- 2.9. Health volunteers in the national health system, its rationale, use and effectiveness
- 2.10. Local governance and community participation in health service delivery
- 2.11. Health Insurance and financing in health care

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- 2.12. Alternative health care system: Ayurveda, homeopathy, Unani, Chinese etc.
- 2.13. Indigenous and traditional faith health and health practices
- 2.14. International Health Agencies: Roles and responsibilities of WHO, UNICEF, UNFPA, Inter-agency relationships, Government-agency coordination: Joint Annual Review meeting
- 2.15. Supervision, types and its usage in health sector
- 2.16. Monitoring and evaluation system in health sector
- 2.17. National Health Training Centre
- 2.18. National and International Disaster Plan, Coordination
- 2.19. Patan Academy of Health Sciences Act, Mission, Goals, Organogram
- 2.20. Scope and function of Patan Academy of Health Sciences executive bodies (senate, executive committee, academic council, faculty board, hospital management committee, subject committee), various other committees

Section (B) - 25 Marks

3. Professional behaviour

- 3.1 Ethics, Bio-ethics and Professionalism
- 3.2 Human dignity and Human Right
- 3.3 Benefit and Harm
- 3.4 Autonomy and Individual responsibility
- 3.5 Consent and capacity to consent
- 3.6 Privacy and confidentiality
- 3.7 Respect for humans and personal integrity
- 3.8 Non-discrimination and non-stigmatization
- 3.9 Respect for cultural diversity and pluralism

4. Assessment and Evaluation

- 4.1 Assessment of performance (in-vitro): Direct observation of skills in the simulated setting, lab, ward etc. with or without checklist, Standardized patients, use and importance, analysis, quality assurance, outcomes and its use in quality control
- 4.2 Assessment of performance (in-vivo): Multi-Source feedback (360 degree evaluation) use and importance for competency based health professions education, analysis, quality assurance, outcomes and its use in quality control
- 4.3 Evaluation: Difference between assessment and evaluation, theory of change and its use in health professions education, process and outcome evaluation, qualitative, quantitative and mixed methods used in evaluation of health professions education

Paper I

Part II: Technical Subject

Section (C) - 50 Marks

1. Hematology

20 %

- Identification and rectification of different types of errors in hematology laboratory
- Concept of laboratory audit and accreditation
- Quality assurance in hematology, concept of NEQAS, EQAS
- Reference preparation of hemoglobin and blood cells, preparation of quality control material for autoanalysers
- Principle, function and maintenance of automated hematology analysers and other instruments used in hematology laboratory

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- Biomedical waste management relevant to hematology laboratory
- Standardization of instruments in hematology laboratory
- Hematopoiesis (erythro, leuco as well as thrombopoiesis) – origin, development, function and fate of blood cells, regulation of hematopoiesis
- Structure and function of normal hemoglobin
- Anemia: definition, classification (morphological as well as etiological), and clinical features and causes of various types, laboratory investigation
- Classification of acute and chronic leukemia, including the WHO classification, laboratory investigation of leukemia
- Collection and preservation of blood for various hematological investigations, mechanism of action, advantages and disadvantages of various anticoagulants
- Principle and procedure of common hematological tests by different methods, errors involved and their rectification
- Different stains used in hematology, their preparation, storage, uses, advantages, disadvantages
- Examination of blood films for parasites
- Blood cell morphology in health and disease, effect of storage on blood cell morphology
- Indication, sites and procedure of bone marrow aspiration and biopsy
- Definition of pancytopenia, causes, laboratory approach to a case of pancytopenia
- Molecular basis of hemoglobinopathies and thalassemias, clinical manifestation and laboratory diagnosis of abnormal hemoglobins and thalassemias, reagents preparation, principle and procedure of test used in their diagnosis
- Leukocyte abnormalities and pathological variations of white cell values
- Leukemoid reactions and its importance
- Definition, classification and laboratory investigation of hemolytic anemia
- Hemostatic mechanism and theories of blood coagulation, physico-chemical properties of coagulation factors
- Etiopathogenesis, classification and investigation of bleeding disorders, including various factor assays, platelet function tests and test for Von willebrand factor
- Disseminated intravascular coagulation: definition, pathophysiology, clinical features, laboratory investigation
- Thrombotic disorders – classification, pathogenesis, clinical features and laboratory investigations, investigation of antiphospholipid antibody syndrome, principle and procedure of tests for lupus anticoagulants
- Classification of plasma cell disorders, Laboratory investigation of multiple myeloma
- Principle, preparation of stain and staining procedure of various cytochemical stains for leucocytes: Myeloperoxidase, Periodic acid Schiff, Sudan Black B(SBB), neutrophilic alkaline phosphatase, alpha naphthol acetate esterase, naphthol AS acetate esterase, choloracetate esterases
- Use of flow cytometry in hematology, procedure of immunophenotyping on blood and bone marrow samples in leukemia and lymphoma
- Processing blood and bone marrow samples for cytogenetic study, molecular biology and detection of Philadelphia chromosome
- Principles of various Molecular methods used in hematology
- Haematological tests and their Principle and procedure of:
 - Reticulocyte count, reticulocyte production index
 - Sickling test, HbS solubility test
 - Osmotic fragility test
 - Coomb's test

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- Kleihauer acid Elution test, Alkali denaturation test
- Ham's test, Sucrose lysis Test
- Electrophoresis – HbF & Hb A2 estimation
- Demonstration of HbH
- Test for G6PD deficiency
- Serum iron, TIBC, ferritin
- Plasma hemoglobin, serum haptoglobin, urine for hemosiderin, urine myoglobin
- BT, CT, PT, APTT
- Platelet function test, Ristocetin co factor assay
- Urine Bence Jones protein
- Mixing study, Factor VIII, IX assay, urea solubility test, fibrinogen assay, Factor VIII: C inhibitor study, Test for D dimer
- Antithrombin III, protein C and protein S assay
- Serum Vitamin B12, serum folate, red cell folate estimation
- Iron and reticulin stain in bone marrow

2. Blood Banking

10%

- History of transfusion medicine
- Indications for blood and component transfusion
- Donor registration, donor selection, blood collection from donors, adverse donor reaction, pre-donation counselling, bleeding of the donor, post donation care, post donation counseling
- Blood collection room equipment, their principles, and use, emergency medicines
- Preservation of donated blood, mechanism of action and composition of blood preservation solution and additive solutions, changes during storage
- Blood components – indications, preparation, storage, transport
- Principles of immune system, central to transfusion medicine, immunology of red blood cells
- Major and minor blood groups, clinical significance and methods of identification in laboratory
- Red cell allo and autoantibody formation and function, platelets and leucocytes antigen and antibodies
- Blood grouping and compatibility testing – major, minor, Coomb's cross match, factors influencing the results of blood grouping
- Coomb's test (direct, indirect) – application, procedure, Rh antibody titre
- Gel testing for antibody screening and identification
- Hazards of blood transfusion
- Hemolytic transfusion reaction: immediate and delayed; immune and non-immune, their pathophysiology, clinical signs and symptoms and laboratory investigation; strategies to prevent transfusion reactions
- Management of Blood Bank Issue Counter
- Screening of blood units for TTI, ELISA, rapid and other tests for diagnosis of transfusion transmitted infections, nucleic acid testing
- Hemapheresis - definition, types of pheresis, machines and techniques
- Stem cell processing and storage for transplantation
- Procedure of HLA matching for bone marrow transplant
- Procedure of chimerism testing/engraftment analysis after bone marrow transplant
- Basics of tissue banking and cord blood banking
- Preparation of antisera and their quality control
- Plasma fractionation and preparation of component of clinical use (albumin,,

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immunoglobulin and coagulation factors)

- Factors preparation by recombinant DNA technology
- Disposal of wastes and biologically hazardous substance in the blood bank
- Medico legal aspects of blood transfusion

- Quality control of blood grouping reagents, QC of anti-human globulin reagent, bovine albumin, normal saline, blood bags and different blood products

- Calibration, validation and maintenance of blood bank equipment, QC of bloodbank techniques, external and internal quality assessment

- Hemovigilance in blood banking
- Use of automation in blood banking

3. Microbiology

30%

Historical development of microbiology with reference to Anton Van Leuwenhoek, Louis Pasteur, Robert Koch, Joseph Lister, Edward Jenner

- Bacterial Classification, Morphology and Cell structure
- Laboratory contamination, and infection; Disposal of infectious material, laboratory safety measure, laboratory discipline and practices.
- 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
- Mechanism, functions, uses and the quality control of the laboratory equipments.
- Classify the types of antigen antibody reactions, hypersensitivity, immediate and delayed.
- Morphology, staining property, cultural characteristics, Biochemical reaction, Antigenic Characters, Pathogenicity, Laboratory diagnosis and the diseases caused by the followings:
 - Gram positive cocci: Staphylococci, streptococci, Pneumococci, Micrococci
 - Gram Positive bacilli: Corynebacteria, bacillus; clostridia
 - Gram negative bacilli (Enterobacteriaceae): Escherichia coli, Klebsiella, Enterobacter, Citrobacter, Proteus, Providencia, Yersinia, Salmonella, Shigella etc.
 - Gram negative cocci: Neiseria
 - Curve Gram negative bacilli: Vibrio, Campylobacter, helicobacter
 - Mycobacteria: Typical and Atypical mycobacteria, Leprosy
 - Haemophilus: H. Influenzae and other species
 - Non fermentative Gram negative bacilli: Pseudomonas, Acinetobacter, Moraxella
 - Spirochaete; Treponema, Borrelia, Leptospira
 - Miscellaneous fastidious organisms: Mycoplasma, Chlamydia, Rickettsia

Antigen Antibody reaction; agglutination, precipitation flocculation, complement fixation and ELISA.

Procedure of:

- Laboratory diagnosis of common Bacterial infection; Pyogenic Infection; Respiratory tract infection, urinary tract infection, sexually

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transmitted diseases, food poisoning, enteric fever, gastroenteritis,
meningitis, diphtheris, tuberculosis, leprosy.

Diagnostic procedure immunological/serological test; Widal tests; ASO titer; CRP,
Rose – Walter test; Brucella agglutination; cold agglutination; VDRL, RPR,
TPHA, ELISA, CFT.

Methods of separation of T and B Cells

Bacteriology (procedure):

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

General Virology:

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

Mycology:

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

Parasitology

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

Systematic Bacteriology

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.

4. Biochemistry

20%

Structure and function of cells

Principle of Biochemistry

- Buffer: definition, types, composition of buffer present in body fluids
- Photometric measurement of light, Beer's law and Lambert's law and their limitations
- Automation in biochemistry; wet and dry chemistry analyzer
- Principles and applications of: Photometry, Spectrophotometry (UV, visible, IR),

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Fluorimetry, spectroscopy, turbidimetry, nephelometry, spectrofluorimetry, atomic emission, reflectometry, mass spectrometry, nuclear magnetic resonance, dry and wet chemistry analyzer, CLIA

- Collection, handling and storage of sample, influence of temperature, nutrition, drugs, posture
- Separation techniques including various chromatography techniques and electrophoresis
- Use of radioisotopes in biochemical analysis
- Recent advances in clinical biochemistry

Chemistry of Amino acids and Proteins

- Structure, function and metabolism of protein
- Biochemical basis and investigation of amino acid metabolism disorder
- Methods to determine the amino acid sequence of proteins
- Procedures and application of:
Electrophoresis: paper, polyacrylamide gel, agarose gel and cellulose acetate
Chromatography : principle, types, uses
Ultra centrifugation, ultrafiltration
Estimation of proteins by various methods

Chemistry of Carbohydrates

- Carbohydrates - introduction, classification, properties (physical, chemical), metabolism, hormones influencing metabolism, isomers, uses, carbohydrate derivatives, medicinally important carbohydrates
- Inborn errors associated with carbohydrate metabolisms
- Diabetes mellitus
diagnostic and monitoring criteria for diabetes
Glucose tolerance test procedure
Principle and procedure of estimation of glucose and hemoglobin A1c by various methods

Chemistry of Lipids

- Lipids: definition, classification, uses, digestion and absorption, transport and storage and metabolism of lipids and hormonal regulation
- Lipoprotein: Introduction, classification, definition and types

Liver Function Test

- Hemoglobin and bilirubin metabolism
- Liver function test : principle and procedures
- Biochemical investigation in acute and chronic liver disease
- Important plasma proteins and their laboratory estimation

Kidney Function Test

- Renal function test: principle, and procedure
- Biochemical investigation in acute and kidney disease
- Glomerular filtration rate and clearance
- Estimation of GFR and creatinine clearance
- Activity and effects of diuretics on different laboratory tests
- Urine analysis for different diseases and methods used

pH, Acid Base Balance

- Concept of pH and buffers. Handerson-Hasselbalch equation
- Acid base regulation and its disorders, assessment of acid base status
- Measurement of electrolytes by various methods
- Blood gas analysis

Pancreatic Function Test

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- Pancreatic function test and their list

Cardiac Function Test

- Biochemical basis and investigation of myocardial infarction
- Estimation of LDH, CPK, GOT, Troponin, CPK MB

Endocrinology

- Formation, regulation, function and laboratory estimation of various clinically important hormones, effect of hypo and hyperfunction
- Biochemical investigation of endocrine disorders
- Metabolism and laboratory investigation of excess and deficiency of calcium, phosphate and magnesium
- Hormones of pancreas and gastro intestinal tract, their formation, uses, excess and deficiency states and relevant laboratory tests
- Principle and procedure of estimation of various hormones in infertility

Tumor Marker

Technical details of methods of estimation of AFP, B-hCG, CEA, CA-125, CA 19-9, CA 15-3, PSA and other tumor markers

Drugs

Theory of drug absorption, metabolism, excretion, pharmacokinetics, pharmacodynamics and pharmacogenetics
Monitoring therapeutic levels of drugs
Individual determinations for important drugs
Drugs of abuse and modalities of DAU testing

Enzymes : Definition, classification and properties of enzyme, regulation of enzymatic activity, Method of estimation of clinically important enzymes

Vitamins, Minerals, Nutrition

Chemistry, source, requirements, absorption, metabolism, biochemical role, excess and deficiency manifestations of various vitamins and minerals, Lab. estimation of the clinically important vitamins and minerals

5. Histopathology and Cytology

10%

Fixatives and preservatives, their types, composition and methods of preparations

Different types of decalcifying agents, their principle and mode of decalcification

Special histological stains, their composition and principle of Haematoxylin, eosin and special stain for connective tissue, protein, amyloid, carbohydrate, lipid and pigments

Principle and application of immunohistochemistry

Immunofluorescence technique

Electron Microscopic and its applications

Safety measures and quality assurance in Histopathology laboratory

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.

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.

Cytology of body fluids and urine: Introduction, methods of sample collection, various methods of staining body fluid samples and urinary cytology.

Cerebrospinal fluid (CSF): Introduction, staining, cytological study and its applications.

Role of automation in cytology

Sex chromatin, Chromosomal Analysis and Karyotyping: Introduction, methods of staining and its applications.

Uses of Cytogenetics, Flowcytometry, and Polarized microscopy in cytological study

6. Immunology **5%**

History of immunology, innate and acquired immunity, mechanisms of innate immunity
inflammation-inflammatory cells, mediators, inflammatory response types, antigens, cells
and organs of immune system, evolution of immunity.

Immunoglobulin: structure and function; regulation of immune response

Advances in the development of vaccines

Theory of hypersensitivity reactions, their types, mechanism, examples

Complement system and its roles in disease

Autoimmune diseases: mechanism of common diseases, principle and procedure for test for
autoimmune diseases

Transplantation Immunology

Major histocompatibility complex, their types, genetics, role of MHC in organ
transplant, MHC association with diseases, principle of transplantation, graft rejection

Preparation, preservation and titration of complement

Monoclonal and polyclonal antibodies preparation, application in biomedical research, clinical
diagnosis and treatment

Diagnostic procedure of common immunological/serological tests

Immunological reaction and their various types, agglutination, precipitation, flocculation,
complement fixation, ELISA

Quality control and evaluation of kits used in laboratory

Immunological methods in clinical laboratories: Method and application of the following:
Double diffusion in agar, Single radial immuno diffusion, Electrophoresis and
immunoelectrophoresis, Chromatography, Ion exchange, Affinity (gel), RIA, Elisa,
Western blotting, Detection of immune complexes, nephelometry, Immunofluorescence,
Agglutination test direct and indirect, Haemagglutination and haemagglutination
inhibition, Complement assays-CFT, Detection of cellular immunity-delayed
hypersensitivity skin test, Assays for lymphocytes-T and B cells, Flow cytometry, Mixed
lymphocyte culture, NK cells neutrophil function test and Histocompatibility testing for
organ transplant

7. Molecular Biology **5%**

Chromosomes structure, chromosomal abnormalities, mutations and important genetic
diseases

Procedure of karyotyping and other methods of chromosomal analysis in various specimens

Collection, storage & processing of tissues, including bone marrow for karyotyping

Recombinant DNA technology: necessary elements

Separation of DNA and RNA

Application of genetics in medicine

Polymerase chain reaction: principle, types, procedure, uses in medicine

In situ hybridization: principle, types, procedure, uses in medicine

Gel electrophoresis: principle, procedure, uses

Recent advances in molecular biology relevant to medicine

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