

GOVERNMENT OF JAMMU AND KASHMIR
JAMMU & KASHMIR SERVICES SELECTION BOARD
CPO Chowk Panjtirthi, Jammu/ Zamzam Complex Rambagh Srinagar
www.jkssb.nic.in

NOTICE

Subject: Syllabus for the post of Junior Microbiologist, Health & Medical Education Department.

The J&K Services Selection Board has advertised the posts of **Junior Microbiologist**, (Health & Medical Education Department) vide Advertisement Notification **04 of 2022** under item **No. 82 and 83**. Accordingly, the syllabus for the said posts is notified as per the details given in **Annexure "A"** to this notice.

This notice is for the purpose of intimation to the concerned candidates only.


(Reyaz Ahmad Malik) JKAS
Controller of Examination
J&K Services Selection Board

No. JKSSB-COE0EXAM(UT)/47/2023-03(7202120) Dated: 29.04.2025

Copy to the: -

1. Commissioner/Secretary to the Government, General Administration Department, Civil Secretariat, J&K, Jammu.
2. Secretary to the Government, Health & Medical Education Department, Civil Secretariat, J&K, Jammu.
3. Director, Information & Public Relations, J&K Government with the request to get the said notification published in at least two leading local newspapers of Jammu/Srinagar for three consecutive days.
4. Member(s) ALL, J&K Services Selection Board.
5. Secretary, J&K Services Selection Board.
6. P.S. to Chairperson, J&K Services Selection Board for the information of Chairperson.
7. In-charge Website, J&K Services Selection Board, Jammu.
8. Office record.

Syllabus for Junior Microbiologist

Total Marks 120

CELL BIOLOGY

Time : 02 Hours

1. Basics of Cell Biology (structure & function)–Discovery of cell and Cell Theory:
2. Comparison between plant and animal cells: cytosol, compartmentalization of eukaryotic cells, cell fractionation.
3. Cell Membrane and Permeability: Chemical components of biological membranes, organization and Fluid Mosaic Model, membrane as a dynamic entity, cell recognition and membrane transport.
4. Cell wall: Plasma membrane. Modification of plasma membrane and intracellular junctions.
5. Endoplasmic reticulum: Structure, function including role in protein segregation.
6. Golgi complex: Structure, biogenesis and functions including role in protein secretion.
7. Lysosomes: Vacuoles and microbodies: Structure and functions
8. Ribosomes: Structures and function
9. Mitochondria: Structure and function
10. Nucleus: Structure and function, chromosomes and their structure.
11. Extracellular Matrix: Composition, macromolecules.

BASICS OF ANATOMY

1. Introduction to the course and the subject of anatomy.
2. Orientation to: the systems of the body; anatomical terminologies; learning methodologies in anatomy; embryology.
3. Microscopic Anatomy: structure of cell, types of tissues, cell cycle and division, introduction to genetics.
4. Respiratory system: Gross and microscopic structures of the lungs.
5. Circulatory system: parts, microscopic anatomy of vessels, gross and microscopic structure of heart, blood vessels- both arteries and veins
6. Digestive system: location, parts and functions of the system, gross and microscopic structure, location of digestive glands- gross and microscopic structure.
7. Urogenital system:
 - a) Reproductive system: gross and microscopic parts of both male and female systems.
 - b) Urinary system: parts, kidney gross and microscopic structure, applied aspects.
8. Musculoskeletal systems: classification, location of the bones and muscles in the body.
9. Nervous systems: parts and division into central nervous system, gross and microscopy of brain and spinal cord, naming of cranial nerves, functions served by each of them.
10. Endocrinology: brief outline of location and function of the endocrine glands.
11. Brief outline of special senses: eye, ear, nose, tongue.

BASICS OF PHYSIOLOGY

1. Blood: Composition of blood and body fluid: Structure and function of RBC: WBC and platelets; lymphatic system. Haemoglobinopathies; Bleeding disorders.
2. Cardiovascular system: nerve supply to heart: Cardiac cycle and regulation of arterial blood pressure; cardiac output; heart rate.
3. Respiratory system: Physiological anatomy; pulmonary ventilation; mechanism of respiratory regulations; transport of blood gases; hypoxia; cyanosis; asphyxia, artificial

respiration.

4. Digestive system: General structure of GI. Tract. Composition. regulation of secretion & functions of salivary juice. gastric juice. pancreatic juice. Motor functions of GIT. Peptic ulcer. gastritis.
5. Excretory system: Structure & functions of kidney: formation of urine: renal function test. mechanism of micturition & abnormalities.
6. Muscle: Structure of muscles: NMJ. Mechanism of skeletal muscle contraction and relaxation. Myasthenia gravis. muscular dystrophy. fatigue.
7. Nervous system: Structure of neurons: Neuronal organization at spinal cord level: Synapse: receptors. reflexes. sensations and tracts: Physiology of pain: functions of different parts of brain. autonomic nervous system: CSF.
8. Special senses: Fundamental knowledge of vision. hearing. taste and smell.
9. Endocrine system: Brief functions of pituitary. thyroid. adrenal glands: pancreatic hormones and disorders.
10. Reproductive system: Menstrual cycle. functions of ovarian hormones.. Spermatogenesis.
11. Skin and temperature: Body temperature regulation and function of skin.

GENERAL MICROBIOLOGY

1. General characters and classification of Bacteria
2. Characteristics of Bacteria. Morphology-structure of a typical bacterial cell- size, shape, arrangement : ultra structures- flagella. pili. cell-wall. cytoplasmic membrane. spore. capsule. prokaryotic cellular reserve materials
3. Sterilization and Disinfection.
4. Physical agents- Sunlight. Temperature. steam at atmospheric pressure and steam under pressure. irradiation. filtration.
5. Chemical Agents- Alcohol. aldehyde. dyes. Halogens. Phenols. Ethylene oxide.
6. Culture Media: Definition. uses. basic requirements. classification. Agar. Peptone. Transport Media. Anaerobic Media. Forms of Media
7. Staining Methods: Simple. Grams staining. Ziehl-Neelsen staining. Negative Staining
8. Collection and Transportation of Specimen: General Principles. Containers. Rejection. Samples Urine. Faces. Sputum. Pus. Body. fluids. Swab. Blood.
9. Disposal of Laboratory/Hospital Waste: Non-infectious waste. infected sharp waste disposal. infected non-sharp waste disposal.

PHYSIOLOGY & ANATOMY

1. Identification of surface landmarks of a human body.
2. Demonstration on muscles of trunk. lower and upper extremities and face.
3. Study on bone on human body with special reference to the origin and insertion of muscles and ligaments.
4. Study on gross anatomy of respiratory. digestive. endocrine. urinary and genital system on a dissected human body.
5. Demonstration on the anatomy of CNS and PNS.

BACTERIOLOGY

1. Staining methods-simple staining. gram staining. capsule staining. spore staining. spirochete staining. Methods of motility testing: hanging drop preparation
2. Preparation of common culture media

3. Sterilization methods
4. Culture methods
5. Cultivation of bacteria and in laboratory
6. Biochemical test used for identification of bacteria
7. Anaerobic culture methods
8. Maintenance & preservation of bacterial cultures

BASICS OF BIOCHEMISTRY

1. Carbohydrates: Classification, Chemistry, Properties of mono, di- and polysaccharides.
2. Proteins: Classification of proteins and amino acids, their properties, structure of proteins and amino acids, plasma proteins, general reactions of amino acids.
3. Lipids: Classification of lipids, properties of fatty acids, phospholipids and sterols, lipoproteins- characterisation, classification
4. Enzymes: General properties and classification.
5. Vitamins and minerals: Fat soluble and water soluble, chemistry, functions, dietary sources, daily requirements, deficiency manifestations, minerals and trace elements.
6. Nucleic acids: Chemistry of purines and pyrimidines, nucleosides, nucleotides, nucleic acids- DNA, RNA, difference between DNA and RNA types of RNA, DNA
7. Acids and bases: definition, ionization of acids, ionic product of water, H^+ concentration, strong acids and bases, weak acids and bases, strength of acids, titration curves of acids and bases.
8. pH – definition, pH scale, calculation of pH, Henderson- Hasselback equations, pH measurement
9. Buffers- definition, components, mechanism of action, buffer capacity, pK of buffers, preparation of buffers, buffers in biological system, commonly used buffers in lab.

METABOLISM

1. Carbohydrates Metabolism: Reactions, energetics and regulation. Glycolysis: Fate of pyruvate under aerobic and anaerobic conditions. Pentose phosphate pathway and its significance. Gluconeogenesis, Glycogenolysis and glycogen synthesis. TCA cycle, Electron Transport Chain, Oxidative phosphorylation. β -oxidation of fatty acids.
2. Lipid Metabolism – Structures and roles of Fatty acids & Glycerols, beta oxidation of saturated fatty acids, oxidation of unsaturated fatty acids, oxidation of odd chain fatty acids, energy yield, Ketone bodies.
3. Amino acid Metabolism – Amino acid breakdown (amino acid deamination, Urea cycle, metabolic breakdown of individual amino acids – glucogenic
4. & ketogenic amino acids), amino acids as biosynthetic precursors (haem biosynthesis & degradation, biosynthesis of epinephrine, dopamine, serotonin, GABA, histamine, glutathione); biosynthesis of essential & non-essential amino acids.
5. Nucleotide Metabolism – biosynthesis of purine & pyrimidine (de novo & salvage pathway); degradation of purine & pyrimidine.

INSTRUMENTATION

1. Study of common equipment used in microbiology lab: Incubators, Hot air oven, Autoclave, anaerobic cultivation apparatus, and Biological safety Cabinet.

2. Microscopy: Principle, resolving power, magnification, types of microscope, staining and specimen preparation for electron microscope
3. Centrifugation: Principle, RCF, RPM, types of centrifuges, applications of centrifugation
4. Chromatography: general principle, types of chromatography, HPLC
5. Electrophoresis: Theory, principle, gel electrophoresis-types of gels, tracking dyes, PAGE, applications of gel electrophoresis
6. Colorimetry and spectrophotometry: Absorption and transmission of light, Principle of colorimetry, Beer- Lamberts law, selection of filters.
7. pH meters and pH measurements: parts, technique and application

MICROBIAL PHYSIOLOGY

1. Growth and cell division: Measurement of growth, cell division, growth yields, steady state growth, batch and continuous growth.
2. Cultivation of microbes: aerobic, anaerobic and facultative. Pure culture and its characteristics. Nutritional types, culture media. Measurement of growth (direct and indirect) and factors affecting growth.
3. Microbial stress responses: Osmotic stress and osmoregulation, Aerobic to anaerobic transitions, Oxidative stress, pH stress and acid tolerance, Thermal stress and heat shock response, Nutrient stress and starvation stress.
4. Intercellular signalling, concept of two component system, Quorum sensing in bacteria, sporulation in *Bacillus subtilis*, mechanism of bacterial competence.

ANALYTICAL BIOCHEMISTRY

1. Demonstration of analytical instruments (principles and applications) available in the Department.
2. Estimation of total protein, DNA and RNA of a bacterial cell.
3. Determination of activity of enzyme. Effect of pH, temperature on enzyme activity.
4. Purification of protein (demonstration only).
5. Determination of MW of protein by PAGE.
6. Study of enzyme by native gel electrophoresis (zymogram).

CLINICAL BIOCHEMISTRY

1. Biochemistry Laboratory instruments: (Photometry, Centrifuge, Water bath). Medical laboratory professional - professionalism in biochemistry laboratory. Calibration of pipettes and other volumetric apparatus. General approach to specimen collection, transport and disposal. Anticoagulants
2. Biochemical Estimation: Estimation of blood sugar, Glucose tolerance tests (GTT), Glycosylated haemoglobin (HbA1C). Lipid determination of serum lipids – cholesterol, triglycerides and lipoprotein fractionation
3. Liver Function Tests: Estimation of Total Protein, Albumin & A/G ratio. Estimation of Bilirubin – total and conjugated. Renal function test: Estimation of NPN substances a) Blood Urea, b) Serum Creatinine, c) Serum Uric acid
4. Enzymes: Determination of Alkaline Phosphates, Acid phosphates, SGOT, SGPT, salivary Amylase.

LABORATORY TQM, ETHICS, AND BIOSAFETY

1. Quality control of product, chemical reagents, good reliable and authentic report, total quality management framework of laboratory.
2. Essential elements in quality assurance programme, internal quality control, control of preanalytical variable, laboratory precision, accuracy and sensitivity validation method.
3. Quality control chart, Cusum chart
4. Internal and External factors for quality control
5. Co-operation and working relationship with other health professionals
6. Dignity and privacy of patient
7. Institutional ethical committee and its role
8. Laboratory ethics of Bio-Safety
9. Code of good and safe laboratory practice for support staff and responsibilities of the workers regarding Biosafety
10. ISO rules for laboratory
11. Laboratory Biosafety Level Criteria (BSL-1-4).
12. Handling, transfer and shipment of specimen, Decontamination and disposal, Treatment and disposal technologies for health-care waste.
13. Chemical, electrical, fire and radiation safety, Safety organization.
14. Laboratory first-aid measures and kit.
15. Safety equipment, Safety signs.

MYCOLOGY

1. Morphology & reproduction of fungi
2. Isolation & identification of fungi
3. Medical importance of *Candida*, *Cryptococcus*, *Malassezia*, *Trichosporon*, *Saccharomyces*.
4. Medical importance of *Aspergillus*, *Zygomycetes*, *Pseudoallescheria*, *Fusarium*, *Piedra*.
5. Dimorphic fungi
6. Dermatophytes
7. Fungi causing mycetoma, keratomycosis & otomycosis.

VIROLOGY

1. General properties of viruses, Classification of viruses, Morphology, Virus structure.
2. Viroids, virusoids, prions, satellite viruses.
3. Principal events involved in viral maturation, Host response to viral infection.
4. Details on important viruses namely Herpes virus, Polio virus, SV40 and AdenoVirus, Poxviruses, Hepatitis viruses, A, B, C, D, E; coronaviruses, Retroviruses.
5. Orthomyxo and paramyxo viral diseases (Influenza, Mumps, Measles) including vaccines.
6. Retrovirus-HIV infection & AIDS
7. Oncoviruses-examples & properties
8. Bacteriophage

PARASITOLOGY

1. An elementary study of types of animal associations- types of parasites, classification of protozoa and helminthes
2. An elementary knowledge of the structure, life history of parasites belonging to the following genera with reference to forms seen in human pathological material, and the methods used to identify them
3. Protozoa: Entamoeba, Dientamoeba, Iodamoeba, Acanthamoeba and Naegleria

4. Flagellates-Giardia, Trichomonas, Chilomastix, Enteromonas, Trypanosome, Leishmania
5. Sporozoa-Plasmodium, Isospora, Eimeria, Balantidium
6. Collection and preservation of specimens for parasitological examinations, preservation of specimens of parasitic egg and embryos, preserving fluids, transport of specimen
7. Detection of intestinal parasites-detection and identification of amoeba and other intestinal protozoans and parasites
8. Examination of blood parasites: thick and thin smear preparations for malaria and filarial, other parasites and concentration methods
9. Examination of biopsy material and other body fluids: brief account of spleen puncture for diagnosis of kala azar and skin biopsy, for parasites, examination of vaginal swabs

MEDICAL MYCOLOGY & VIROLOGY

1. Collection and transport of specimens
2. Processing of samples for microscopy and culture
3. Direct examination of specimens by KOH, Giemsa, Lactophenol cotton blue
4. Examination of histopathology slides for fungal infections.
5. Isolation and identification of medically important fungi & common laboratory contaminants
6. Demonstration of animal cell cultures, Media, sterilization, demonstration of cell line.
7. Detection of Measles Virus by ELISA.
8. Detection of Dengue Virus by ELISA.
9. Detection of HIV by ELISA.

MEDICAL PARASITOLOGY

1. Identification of different disease causing Arthropods (Housefly, Mosquito etc.)
2. Identification of different disease causing Helminth and Protozoan parasites.
3. Identification of different phases of life cycle of arthropods, protozoa, helminth, having medical importance for causing disease.
4. Slide identification of microfilaria, Taenia solium, ascaris, and different stages of malaria.
5. Examination of stool for OPV (Ova-parasite Cyst).

ENTOMOLOGY

1. Introduction: classification of arthropods of public health importance
2. Role of arthropods in the transmission of diseases
3. Mosquito: morphology, life cycle, binomics and public health importance of anopheles, culex, aedes, and mansonina
4. Insecticides used for the control of arthropods of public health importance
5. Mosquito borne diseases and their control
6. Phlebotomus (sandfly)-morphology, life history, public health importance and control
7. Housefly: morphology, life history, disease relationship, public health importance and control
8. Fleas-morphology, life cycle, disease transmitted and control

MOLECULAR BIOLOGY

1. DNA replication, transcription and translation. Post transcriptional (capping,

- polyadenylation, splicing, intron and exons) and post translational modification.
2. Transcriptional regulation in prokaryotes. Operon concept –lac, trp operons.
3. DNA damage and repair: photoreactivation, excision – BER and NER, recombination. SOS repair, mismatch. Methyl-directed mismatch repair, very short patch repair, rDNA methylation, transposition. Site directed mutagenesis.
4. Mechanism of genetic exchange Plasmid and bacterial sex. Types of plasmids (F Plasmid : a Conjugate plasmid. Mobilization of Non-conjugative plasmid. Rplasmid, Col plasmid. Copy number and incompatibility). Episomes.
5. Transduction (Generalized transduction, Specialized Transduction)-genemapping
6. Isolation of mutant (UV/NTG/ HNO₂/Dyes).
7. DNA isolation (plasmid & chromosomal).
8. Agarose gel electrophoresis for DNA.
9. Amplification of DNA /RNA by PCR.
10. Restriction analysis of bacterial DNA.
11. Demonstration of transformation and transduction process.
12. Induction of β -galactosidase in *E. coli*.

SYSTEMATIC BACTERIOLOGY

1. Gram positive cocci of medical importance including *Staphylococcus*, *Pneumococcus*, *Streptococcus*.
2. Gram negative cocci of medical importance including *Neisseria*, *Haemophilus*
3. Gram positive bacilli of medical importance including *Clostridium*, *Bacillus*, *Corynebacterium*.
4. Gram negative bacilli of medical importance including *Vibrios*, *Brucella*, *Pseudomonas*, *Bacteroides*.
5. Enterobacteriaceae
6. *Mycobacterium*
7. *Spirochaetes*
8. *Chlamydiae*
9. *Mycoplasma*
10. *Rickettsiae*

The study of the above mentioned bacteria should be focused on morphology, antigenic structure, pathophysiology, and laboratory diagnostics.

IMMUNOLOGY

1. Introduction to immunology: Infection, definition, classification, sources, methods of transmission, factors predisposing to microbial pathogenicity, types of infectious diseases
2. Immunity: Mechanisms of innate immunity, acquired immunity, Measurement of immunity, Herd immunity
3. Antigens: Determinants of antigenicity, biological classes
4. Antibodies: Structure, classes, abnormal immunoglobulins, immunoglobulins specificities
5. Antigen-Antibody reaction: General features, measurement, serological reactions
6. Complement system: General properties, components, complement activation: classical, alternative and lectin pathways;
7. Structure and functions of the immune system: Central and peripheral lymphoid organs, Cells of the lympho reticular system, T and B cell maturation, Null cells, MHC and MHC restriction
8. Immune response : Humoral immune response, production of antibody, Monoclonal

- antibodies. Cellular immune response. Cytokines
9. Autoimmunity: Mechanism, classification and pathogenesis of autoimmune diseases

IMMUNOLOGY & HAEMATOLOGY

1. Collection of blood by venepuncture, separation of serum and preservation of serum for short and long periods
2. Performance of serological tests viz. Widal, VDRL, ASO, Enzyme linked immunosorbent assay
3. Latex agglutination tests
4. Separation of lymphocytes by centrifugation etc
5. Separation and characterization of blood cell
6. Estimation of TC & DC
7. Separation of macrophage
8. Ouchterlony double diffusion technique
9. Detection of immunoglobulins by ELISA
10. Precipitation techniques: immunodiffusion, immunoelectrophoretic method

COMPUTER FUNDAMENTALS

1. Basic concept of Computer System. Introduction. Characteristics of Computer. Components of Computer. Basic organization of Computer System (I/P, O/P, Memory & CPU units).
2. Generation of Computer: 1st to 4th generations with characteristics
3. Operating System: Introduction; Operations of OS. Evolution of OS. Batch processing, Multiprogramming
4. Process Management: Process concept, Process States, Process control block (PCB)
5. Process Synchronization: Cooperating process, Critical-Section problem and solution, Semaphores (Binary & counting).
6. Software's-use of MS word, MS EXCEL-Bar diagram, Pie diagram and line diagram MS power point

BIOINFORMATICS

1. Introduction to bioinformatics.
2. Data Generation and Data Retrieval: Sequence submission tools (BankIt, Sequin), Sequence file format (flat file, FASTA, Genbank, Genpept, EMBL, Swiss-Prot), Data retrieval systems (NCBI Entrez).
3. Sequence Alignment and Pattern recognition: Sequence similarity searching, Methods of Alignment (Dot matrix, Dynamic Programming, BLAST and FASTA algorithm), Local and global alignment, pairwise and multiple sequence alignments (without algorithm), Concept of identity and homology of sequences.
4. Ligand- protein interaction.

GENERAL PATHOLOGY

1. Aims and objectives of the study of pathology. Meaning of terms, etiology, pathogenesis and lesions.
2. Causes of disease and cell injury – features of cell injury, mechanism of cell injury – hypoxia, free radical injury. Necrosis and gangrene.

3. Inflammation- definition, events of acute inflammation, chemical mediator of inflammation, morphological types of acute inflammation, chronic inflammation, difference between acute and chronic inflammation
4. Repair – primary healing, secondary healing, factors affecting healing and repair healing of skin, muscle and bone.
5. Fluid and hemodynamic derangements – oedema, hyperemia, Haemorrhage, shock, embolism, thrombosis, infarction.
6. Neoplasia, characteristic of benign and malignant tumors, grading and staging of malignant tumors, a brief outline of the carcinogenic agents and methods of diagnosis of malignancy and general effects of malignancy on the host.
7. Nutritional disorders: deficiency disorders (protein deficiency, vitamin deficiency (A, B, C, D, E) causes, features, a brief outline of the methods of diagnosis.

BIO-STATISTICS

1. Introduction to Biostatistics: Definition, role of statistics in health science
2. Sampling: Population, sample, sampling, reasons for sampling, probability and non-probability sampling, Methods of probability sampling-simple random.
3. Measures of location: Arithmetic mean, median, mode, quartiles and percentiles – definition
4. Measures of variation: Range, inter-quartile range, variance, standard deviation, coefficient of variation- definition.
5. Tests of significance: Basic of testing of hypothesis - Null and alternate hypothesis, one way analysis of variance (ANOVA).
6. Correlation and Regression: Concept and properties of correlation coefficient, Testing the significance of correlation coefficient, Linear and multiple regressions.
7. Application of Statistics: Application of SPSS, Origin lab, Software, Use of software for pathological data analysis

COMPUTER & BIOSTATISTICS

1. Operation of personal computer.
2. Data storage, reporting, data presentation in computer.
3. Application of MS-office in pathological laboratories.
4. Problem solving on mean, median, SEM, SD.
5. Problem solving on t test: match group, single group study, population mean study.

DIAGNOSTIC

MICROBIOLOGY

1. Vaccine, Disease control by vaccination, national vaccination schedules, Types of vaccine: live microorganism, attenuated organism, genetically modified organism, protein, edible, synthetic, naked DNA, recombinant and anti-idiotype vaccine, Hazards of immunization.
2. Epitope design and its application in immunodiagnosis tests, Immunotechniques – agglutination, precipitation, immunofluorescence, ELISA
3. Western blot, FACS, Immunohistochemical methods.
4. Epidemiology, symptomatology, General description of microbial pathogens, diagnosis, prevention and therapy of - meningitis, tuberculosis, leprosy, urinary tract infection,

- cholera, ring-worm, syphilis, diphtheria, malarial parasite, *Giardia* and *Leishmania*.
- 5. Anti microbial susceptibility testing, MIC
- 6. Identification of *E. coli*, *P. aeruginosa*, *S. aureus*, *Salmonella* sp. by biochemical tests (IMVIC Test).
- 7. Disposal of contaminated materials like cultures
- 8. Disposal of infectious waste
- 9. Bacteriological tests for water and milk
- 10. Grouping of Streptococci by latexagglutination test.

APPLIED MICROBIOLOGY

- 1. Normal microbial flora of the human body.
- 2. Epidemiology of communicable diseases: host, reservoir, carrier, vector; Infective agents- modes and routes of infection, pathogenesis and symptoms, control and eradications of infectious diseases
- 3. Hospital acquired infections
 - i. Detailed procedure in sample collection, transportation and laboratory diagnosis of diseases of Upper and Lower respiratory tract infection
 - ii. Genital tract infection
 - iii. Infections of the eye and ear
 - iv. Skin and soft tissue infection
 - v. Pyogenic infection
- 4. Laboratory procedures in the diagnosis of viral infections
- 5. Laboratory diagnosis of fungal infections
- 6. Quality control in microbiology laboratory
- 7. Sterility test
- 8. Automation in microbiology

CLINICAL PATHOLOGY

- 1. Collection of urine and stool specimen, types of urine and stool specimen and preservation of urine and stool.
- 2. Routine examination of urine—physical and Microscopic examination.
- 3. Chemical test of urine for glucose, protein, Ketonebodies, bilirubin, urobilinogen & blood.
- 4. Laboratory investigation, Serous fluid and Gastric juice.
- 5. Collection and processing of CSF and its laboratory investigation.
- 6. Routine test for stool and occult blood test.
- 7. Examination of Sputum— routine and special test.
- 8. Semen Examination –routine and special test.
- 9. Various methods of detecting HCG level.
- 10. Physical examination of urine.
- 11. Microscopic examination of urine sediment.
- 12. Laboratory testing of serous fluid.
- 13. Laboratory testing of synovial fluid, gastric juice and pleural fluid.
- 14. Routine examination of sputum.
- 15. Routine test for stool and occult blood test.

SYSTEMIC PATHOLOGY

1. Blood Vessels: Atherosclerosis, thromboangitisobliterance, varicose vein, DVT, thrombophlebitis, lymphoedema
2. Disease of Heart: Congestive cardiac failure, ischemic heart disease, rheumatic heart disease, infective heart disease (pericarditis, myocarditis, endocarditis)
3. Respiratory System: Pneumonias, Bronchiactesis, Emphysema, Chronicbronchitis, Asthma, Tuberculosis etc.
4. Joints Disorders: Arthritis-types and their features.
5. Bone Disorders: Osteoporosis, Paget's disease, Osteogenesis Imperfecta, Osteomyelitis, tumors-Osteosarcoma, Chonrosarcoma, Ewings sarcoma, Multiple myeloma (a brief outline only)
6. Muscles: Muscular dystrophy, Myasthenia gravis
7. Nervous System: Meningitis, encephalitis, vascular diseases of brain, poliomyelitis, nerve injuries.