

Annexure-VIII

MODEL QUESTIONS

KERALA UNIVERSITY OF HEALTH SCIENCES FIRST YEAR M.Sc (MLT) - BIOCHEMISTRY DEGREE EXAMINATION

PAPER - I GENERAL BIOCHEMISTRY & CHEMISTRY OF BIOMOLECULES

Time: 3 hours

Maximum marks: 100

Answer all questions. Each question carries 10 marks

1. Write brief on:
 - (a) Different forms of DNA
 - (b) Various mode(s) proposed to elucidate the structure of biological membrane.
2. Define pH. Derive Henderson – Hasselbalch equation. Explain pH meter.
3. Enumerate the role of radio isotopes in biochemistry. Explain the disposal of radioactive wastes.
4. Write briefly on:
 - (a) Donnan's membrane equilibrium.
 - (b) Buffers.
5. Discuss the secondary structure of protein in detail. What forces hold the secondary structure together? What are the main differences between secondary structures of globular and fibrous proteins?
6. Draw the chemical structure of purines and pyrimidines found in nucleic acids. Discuss the chemical differences in the structure of DNA and RNA. Why is uracil not found in DNA?
7. Explain Ion exchange chromatography and Affinity chromatography. Which type of macromolecules are generally separated by these types of chromatography and why?
8. Discuss SDS-PAGE in detail.
9. What are carbohydrates? Define isomers, anomers and epimers with the help of chemical structure giving specific examples.
10. Write short notes on:
 - (a) Atomic absorption spectrophotometry
 - (b) Chemiluminescence

KERALA UNIVERSITY OF HEALTH SCIENCES

**FIRST YEAR MSc (MLT) - BIOCHEMISTRY
DEGREE EXAMINATION**

MODEL QUESTIONS

**PAPER- II ENZYMOLOGY, METABOLISM AND INBORN ERRORS OF
METABOLISM**

Time: 3 hours

Maximum marks: 100

Answer all questions. Each question carries 10 marks

1. Enumerate different types of glycogen storage diseases.
2. Explain the enzyme defects of urea cycle which leads to aminoaciduria.
3. Analysis of cerebrospinal fluid
4. Explain briefly
 - (a) Abnormal urine composition.
 - (b) Amniotic fluid analysis
5. What is meant by enzyme inhibition? With the help of Lineweaver- Burk plot, differentiate between competitive, non-competitive and uncompetitive type of inhibition.
6. Name the different pathways of fatty acid catabolism. Discuss the various steps involved in Beta oxidation of fatty acids. Calculate the number of moles of ATP formed when stearic acid undergoes Beta oxidation.
7. Write short notes on:
 - (a) Prostaglandins
 - (b) Salvage pathway of purine synthesis
8. Describe the various steps of HMP shunt pathway. Under what conditions a cell metabolises glucose preferentially through HMP shunt? Which products of HMP shunt are important and why?
9. Discuss clinically important enzymes associated with liver diseases.
10. Write briefly on:
 - (a) Heme synthesis
 - (b) Disorders of purine metabolism.

KERALA UNIVERSITY OF HEALTH SCIENCES

**FIRST YEAR M.Sc (MLT) - BIOCHEMISTRY
DEGREE EXAMINATION**

MODEL QUESTIONS

PAPER - III VITAMINS AND HORMONES

Time : 3 Hours

Maximum marks : 100

Answer all questions. Each question carries 10 marks

1. How do vitamin C and E deficiency effect the antioxidant defense system of the body?
2. Enumerate disorders of hyper function of adrenal cortex. Give the diagnostic criteria for evaluation of patients suspected of Cushing's syndrome.
3. Mechanism of action of hormones.
4. Write short notes on:
 - (a) Cyclic AMP
 - (b) Co-enzyme forms of niacin, pyridoxine and riboflavine.
5. Briefly explain the chemistry, sources, daily requirement, functions and deficiency symptoms of vitamin D.
6. Write briefly on the synthesis and biochemical function of thyroid hormones.
7. Write short notes on:
 - (a) Hypothalamic hormones..
 - (b) 5 HIAA.
8. Write an account of folic acid involvement in one carbon metabolism.
9. Explain briefly on:
 - (a) Vitamin K in carboxylation
 - (b) Vitamin A
- 32.** Explain the methods for the determination of VMA and its interpretation

KERALA UNIVERSITY OF HEALTH SCIENCES

**FIRST YEAR M.Sc (MLT) - BIOCHEMISTRY
DEGREE EXAMINATION
MODEL QUESTIONS**

PAPER - IV GENERAL PHYSIOLOGY, NUTRITION & MINERAL METABOLISM

Time: 3 Hours

Maximum marks: 100

Answer all questions. Each question carries 10 marks

1. Define anaemia. What are the laboratory findings in anaemia? What is the mechanism of iron deficiency anaemia?
2. Write on the Biochemical importance and disease states of fluorine and selenium.
3. Discuss the cascade of blood coagulation process
4. Write short notes on:
 - (a) Protein malnutrition
 - (b) Wilson's disease
5. Write briefly on:
 - a) Oxygen dissociation curve
 - b) Antioxidants
6. Write briefly on:
 - (a) Mechanism of detoxification.
 - (b) Digestion and absorption of lipids
7. Write briefly on calcium homeostasis and deficiency diseases.
8. Explain briefly on:
 - (a) Iodine
 - (b) Magnesium
9. Describe the various components of electron transport chain. Add a note on inhibitors of this chain.
10. Define a balanced diet. Formulate a diet for a college student

KERALA UNIVERSITY OF HEALTH SCIENCES

**SECOND YEAR M.Sc (MLT) - BIOCHEMISTRY
DEGREE EXAMINATION**

**MODEL QUESTIONS
PAPER - V. MOLECULAR BIOLOGY AND IMMUNOLOGY**

Time : 3 Hours

Maximum marks : 100

Answer all questions. Each question carries 10 marks

1. Explain briefly:
 - (a) Restriction endonucleases
 - (b) Use of DNA polymorphism for pre-natal diagnosis.
2. How does glucose, lactose and CRP regulates expression of lac operon?
3. Give the principle and application of ELISA and Immunoelectrophoresis.
4. What is the principle of Hybridoma Technology? Enumerate its uses in medical sciences.
5. Write short notes on:
 - (a) Regulation of gene expression.
 - (b) DNA finger printing and its significance.
6. Explain briefly:
 - (a) Mutations
 - (b) Repair mechanisms of DNA.
7. Write short notes on:
 - (a) RFLP.
 - (b) Reverse transcriptase and its significance.
8. Explain the Blotting of DNA and the detection of blot.
9. Write briefly on:
 - (a) Ribozymes.
 - (b) Cosmids.
10. Write short notes on:
 - (a) Genetic code.
 - (b) Transgenic organisms.

KERALA UNIVERSITY OF HEALTH SCIENCES

**SECOND YEAR MSc (MLT) - BIOCHEMISTRY
DEGREE EXAMINATION
MODEL QUESTIONS**

**PAPER -VI DIAGNOSTIC BIOCHEMISTRY, RECENT ADVANCES IN CLINICAL
CHEMISTRY & BIOSTATICS**

Time: 3 Hours

Maximum marks: 100

Answer all questions. Each question carries 10 marks

1. Enumerate the liver function tests and write briefly the differential diagnosis of jaundice.
2. Write short notes on :
 - (a) Clinically useful tumour markers.
 - (b) Hypothyroidism
3. Give an account of the various laboratory tests to evaluate pancreatic function.
4. Describe the salient features of Random Access Analyzers.
5. What is the role of external and internal Quality control in clinical chemistry?
6. Discuss the following
 - (a) Immunological defects in AIDS.
 - (b) The addition rule and the multiplication rule of probability.
7. Write short notes on :
 - (a) Diagnostic value of iso enzymes of alkaline phosphatase.
 - (b) Point of care test (POCT)
8. Describe the various acid-base parameters measured in a clinical Biochemistry laboratory. Discuss their significance.
9. Write short notes on:
 - (a) Analysis of calculi
 - (b) Mass spectrometry.
10.
 - (a) Discuss the assay of alcohols and barbiturates.
 - (b) Automation in clinical laboratory.

KERALA UNIVERSITY OF HEALTH SCIENCES

**FIRST YEAR MSc (MLT) - MICROBIOLOGY
DEGREE EXAMINATION
MODEL QUESTIONS**

PAPER - I. GENERAL MICROBIOLOGY

Time: 3 Hours

Maximum marks: 100

*Answer all questions. Each question carries 10 marks
Draw diagrams wherever necessary*

1. Universal safety precautions in laboratory practice.
2. Anaerobic culture techniques.
3. Confocal microscope.
4. Methods of viable bacterial counting.
5. ONPG test.
6. Cell wall of bacteria.
7. Determinants of bacterial virulence.
8. R factor.
9. Hydroclave.
10. Gnotobiotic animals.

KERALA UNIVERSITY OF HEALTH SCIENCES

**FIRST YEAR M.Sc (MLT) - MICROBIOLOGY
DEGREE EXAMINATION
MODEL QUESTIONS**

PAPER -II SYSTEMATIC AND DIAGNOSTIC BACTERIOLOGY

Time: 3 Hours

Maximum marks: 100

*Answer all questions. Each question carries 10 marks
Draw diagrams wherever necessary*

1. Atypical Mycobacterium.
2. Epidemiological typing of Salmonella.
3. Laboratory. diagnosis of plague.
4. Detection of enterotoxin.
5. Pathogenesis and laboratory diagnosis of Rheumatic fever.
6. CAMP test.
7. Fluorescent Treponemal Antibody test.
8. Bartonellosis.
9. Laboratory diagnosis of non- fermentative Gram negative bacilli.
10. Bacterial vaginosis.

KERALA UNIVERSITY OF HEALTH SCIENCES

**FIRST YEAR M.Sc (MLT) - MICROBIOLOGY
DEGREE EXAMINATION**

MODEL QUESTIONS

PAPER - III MEDICAL PARASITOLOGY AND MYCOLOGY

Time: 3 Hours

Maximum marks: 100

*Answer all questions. Each question carries 10 marks
Draw diagrams wherever necessary*

1. Preservation of fecal specimen for parasites.
2. Cultivation of *Entamoeba histolytica*.
3. Laboratory diagnosis of toxoplasmosis.
4. Tissue nematodes.
5. Serodiagnosis of malaria.
6. Fungal aetiology of mycetoma.
7. Selective media for fungi.
8. Identification of yeast.
9. Asexual conidiogenesis.
10. Chromomycosis.

KERALA UNIVERSITY OF HEALTH SCIENCES

**FIRST YEAR M.Sc (MLT) - MICROBIOLOGY
DEGREE EXAMINATION**

MODEL QUESTIONS

PAPER - IV IMMUNOLOGY

Time: 3 Hours

Maximum marks: 100

*Answer all questions. Each question carries 10 marks
Draw diagrams wherever necessary*

1. Principle of production of monoclonal antibodies.
2. Immunological memory.
3. Sub populations of T cells.
4. Macrophage migration inhibition test.
5. Adjuvants.
6. Counter current immune electrophoresis and its applications in bacteriology.
7. MHC molecule.
8. Theories of antibody synthesis.
9. Hypersensitivity reactions.
10. Current concepts of antigen presentation.

KERALA UNIVERSITY OF HEALTH SCIENCES

**FIRST YEAR M.Sc (MLT) - MICROBIOLOGY
DEGREE EXAMINATION**

MODEL QUESTIONS

PAPER -V. MEDICAL VIROLOGY

Time: 3 Hours

Maximum marks: 100

*Answer all questions. Each question carries 10 marks
Draw diagrams wherever necessary*

1. Viral inclusion bodies.
2. Tissue culture and its use in virology.
3. Live viral vaccines.
4. Pathogenesis and laboratory diagnosis of Rota virus.
5. H₁N₁ Influenza.
6. Transport and storage of samples for viral isolation.
7. Serodiagnosis of viral hepatitis.
8. Antiviral agents.
9. Epstein – Barr virus.
10. Immuno fluorescent techniques in viral diagnoses.

KERALA UNIVERSITY OF HEALTH SCIENCES

**FIRST YEAR M.Sc (MLT) - MICROBIOLOGY
DEGREE EXAMINATION**

MODEL QUESTIONS

**PAPER - VI APPLIED MEDICAL MICROBIOLOGY AND RECENT
ADVANCES**

Time: 3 Hours

Maximum marks: 100

*Answer all questions. Each question carries 10 marks
Draw diagrams wherever necessary*

1. Biofilms.
2. E-test and its use.
3. Nosocomial infections.
4. Laboratory investigations to contain MRSA outbreak.
5. DNA probes and its diagnostic applications.
6. Automation in microbiology.
7. Monitoring of operation theatre sterility.
8. Restriction fragment length polymorphism.
9. COSMIDS.
10. Immuno blot assay.

KERALA UNIVERSITY OF HEALTH SCIENCES

**FIRST YEAR M.Sc (MLT) - PATHOLOGY
DEGREE EXAMINATION**

MODEL QUESTIONS

PAPER I – HAEMATOLOGY

Time: 3 Hours

Maximum marks: 100

Answer all questions. Each question carries 10 marks

Draw diagrams wherever necessary

1. Classify Anaemia. Describe the laboratory diagnosis of iron deficiency anaemia
2. Romanowsky stains
3. Trouble shootings of Hematology analyzers
4. Applications of PCR in Haematology
5. Total leucocytes counting techniques
6. APAAP technique
7. Histograms
8. Laboratory investigations required prior to Bone marrow transplantation
9. Applications of fluorescent dyes in Haematology
10. Anticoagulants

KERALA UNIVERSITY OF HEALTH SCIENCES

**FIRST YEAR M.Sc (MLT) - PATHOLOGY
DEGREE EXAMINATION**

MODEL QUESTIONS

PAPER II - HISTOPATHOLOGY

Time: 3 Hours

Maximum marks: 100

*Answer all questions. Each question carries 10 marks
Draw diagrams wherever necessary*

1. Reception of histology specimen in a histopathology laboratory
2. Micro anatomical fixatives
3. Dehydrating agents
4. Embedding techniques
5. Faults and remedies in section cutting
6. Use of microwave oven in histopathology and its advantages
7. In situ hybridization
8. Direct Immuno fluorescent techniques in histopathology
9. Autopsy techniques
10. Flow cytometry

KERALA UNIVERSITY OF HEALTH SCIENCES

**FIRST YEAR M.Sc (MLT) - PATHOLOGY
DEGREE EXAMINATION**

MODEL QUESTIONS

PAPER III CLINICAL PATHOLOGY & CYTOGENETICS

Time: 3 Hours

Maximum marks: 100

*Answer all questions. Each question carries 10 marks
Draw diagrams wherever necessary*

1. Fluorescent In situ Hybridization for chromosome analysis
 2. Microscopic Examination of urine
 3. Various methods of detecting HCG levels
 4. Collection and examination of CSF
 5. Klinefelter syndrome
 6. Concentration techniques for the detection of Ova & Cysts
 7. Barr Body
 8. Examination of synovial fluid
 9. Semen analysis
 10. Detection of Bence-Jones protein
- (10X10=100 marks)

KERALA UNIVERSITY OF HEALTH SCIENCES

**FIRST YEAR M.Sc (MLT) - PATHOLOGY
DEGREE EXAMINATION**

MODEL QUESTIONS

PAPER IV - CYTOLOGY

Time : 3 Hours

Maximum marks : 100

Answer all questions. Each question carries 10 marks

Draw diagrams wherever necessary

1. Normal cytology of female genital tract
2. Collection, preservation and processing of pleural fluid
3. Cyto centrifuge preparations
4. Automation in cytology
5. Fine needle aspiration cytology
6. Shorr's staining
7. Quality control in cytology
8. Density gradient separation of malignant cells
9. Spray fixatives
- 10 Immunocyto chemistry

(10x10 = 100 marks)

KERALA UNIVERSITY OF HEALTH SCIENCES

**SECOND YEAR M.Sc (MLT) - PATHOLOGY
DEGREE EXAMINATION**

MODEL QUESTIONS

Paper - V: BLOOD BANKING AND IMMUNOPATHOLOGY

Time: 3 Hours

Maximum marks: 100

*Answer all questions. Each question carries 10 marks
Draw diagrams wherever necessary*

1. ABO blood group system.
2. Blood Component Preparation.
3. Quality Assurance in Transfusion Service
4. Transfusion Reactions
5. Screening tests
6. Recombinant DNA Technology
7. Molecular genetic techniques for clinical Analysis of the immune systems.
8. Type I hyper sensitivity Reactions
9. Experimental Animal methods to raise Antibodies
10. AIDS

KERALA UNIVERSITY OF HEALTH SCIENCES

**SECOND YEAR M.Sc (MLT) - PATHOLOGY
DEGREE EXAMINATION**

MODEL QUESTIONS

**Paper- VI: LABORATORY ORGANIZATION, QUALITY CONTROL AND
RECENT ADVANCES IN PATHOLOGY**

Time: 3 Hours

Maximum marks: 100

*Answer all questions. Each question carries 10 marks
Draw diagrams wherever necessary*

1. Open and closed system analyzers,
2. Purchasing of laboratory equipments and chemicals
3. Quality control systems.
4. Molecular Techniques in Histopathology.
5. Computerization in histopathology laboratory use of software's.
6. Laboratory safety.
7. Organization of Central Laboratory in 300 bedded hospital
8. Recent advances in cytogenetic.
9. New generation equipments used in Blood Bank.
10. Maintenance of laboratory records and statistics.
