B.Sc.(M.L.T.) [1st Year]

BF/Sup/2008/06

Basic Principles of Biochemistry

M.M. : 100 **Time : 3 Hours**

Note : Attempt all questions.

1. What are different types of Radioisotopes and what is their use in clinical biochemistry. [10]

2. **Differentiate between:** [10]
   a. Mean and Median.
   b. SD and CV

3. What are Buffers? Explain preparation of a Standard buffer. Add a note on body buffers. [10]

4. How laboratory workers can prevent transmission of pathogens. [10]

5. Explain briefly the concept of Osmotic pressure. Describe the process of dialysis and give its importance. [10]

6. Write a note on disposal of biological samples. [10]

7. How is Chloride estimated? What is the importance of Chloride estimation? [10]

8. Discuss the ethical issues related to laboratory workers. [10]

9. Explain different methods of preparation and storage of distilled water. [10]

10. A. **Give normal range of following:** [6]

a.	Serum sodium	b.	Serum proteins
c.	Glycosylated haemoglobin	d.	SGPT(ALT)
e.	24 hrs. Urinary Creatinine	f.	Blood urea

B. How are Ketone bodies analysed in Urine? Give their clinical importance in brief. [4]

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Fundamentals of Applied Histopathology/Histology

M.M. : 100 **Time : 3 Hours**

Note : Attempt all questions.

1. Discuss the basic principles and methods to Haematoxylin and eosin staining. [20]

2. **Write notes on:**
   a. Structure and functions of a nephron. [10]
   b. Structure and functions of Juxta Glomerular apparatus. [10]

3. **Write short notes on:**
   a. Functions of adrenal gland. [6]
   b. Sarcomere. [6]
   c. Compact bone. [6]

4. **Write short notes on:**
   a. Structure and function of Platelets. [6]
   b. Types of Synovial joints. [6]

5. **Write short notes on:**
   a. Decalcification. [6]
   b. Procedure for reception, recording and labeling of histology specimens. [6]
   c. Various steps in the preparation of Paraffin block. [6]

6. **Write short notes on:**
   a. How will you prepare treat, stain and interpret a Cervical smear. [6]
   b. Stains for amyloid. [6]

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Basic Techniques in Laboratory Haematology

M.M. : 100 **Time : 3 Hours**

Note : **Q.No. 10 is compulsory.** *Attempt any EIGHT Questions out of other NINE questions.*

1. Normal cell components of blood. [10]

2. Precautions to be taken for collection of blood sample. [10]

3. Advantages of blood cell counters. [10]

4. Describe manual platelet count. [10]

5. Describe the factors influencing Packed Cell Volume[PCV]. [10]

6. Describe the findings of normal semen analysis. [10]

7. Factors influencing the specific gravity of Urine. [10]

8. Internal quality assurance in a hematology laboratory. [10]

9. **Draw diagrams of:**
   a. Crystals in urine. [5]
   b. WBC pipette. [5]

10. **Write in brief about:**
    a. Increased WBC's in Cerebrospinal Fluid. [5]
    b. Erythrocyte sedimentation rate. [5]
    c. Hemoglobin estimation. [5]
    d. Protein estimation in urine. [5]

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General Microbiology

M.M. : 100 **Time : 3 Hours**

Note : Attempt all questions.

1. Quality control in Microbiology. [15]

2. **Tabulate the difference between:** [3x5=15]
   a. Selective media and enrichment media.
   b. Gram positive cell wall and gram negative cell wall.
   c. Autotrophs and Heterotrophs.

3. Describe anaerobic culture methods. [10]

4. **Describe the preparation and application of the following culture media:**
   a. Nutrient broth.
   b. Chocolate agar.
   c. Alkaline peptone water. [3x5=15]

5. **Write brief notes on the following:** [3x5=15]
   a. Sterilization by Radiations.
   b. IgA immunoglobulin.
   c. Ziehl-Neelsen stain.

6. **Write notes on the following:** [3x10=30]
   a. Contributions of Louis Pasteur.
   b. Dark ground microscope.
   c. Agglutination reactions.

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Fundamentals of Haemtology

M.M. : 100 **Time : 3 Hours**

Note: *Attempt all questions.*

1. Investigation of Rh testing and incompatibility. [10]

2. Precautions during platelet collection. [10]

3. Role of factor VIII in coagulation. [10]

4. Laboratory investigations of Hemolytic anemia. [10]

5. Coagulation theories. [10]

6. Production of White blood cells. [10]

7. Describe the procedure of estimation of fetal hemoglobin. [10]

8. a.. Target red blood cells. [5]
   b. Advantages of packed red blood cell transfusion. [5]

9. a. Sodium citrate. [5]
   b. Estimation of fibrinogen. [5]

10. a. Bone marrow examination needle. [5]
    b. Manual platelet count. [5]

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Systemic Microbiology including Virology & Parasitology

M.M. : 100 **Time : 3 Hours**

Note: *Attempt all questions.*

1. **Draw labeled diagram of the following:** [3x5=15]
   a. Influenza Virus.
   b. PBF of Plasmodium Falciparum.
   c. India Ink preparation of Pneumococci.

2. **Tabulate the difference between the following:** [3x5=15]
   a. Chlamydia and Viruses.
   b. Taenia Solium and Taenia saginata.
   c. Prokaryotes and Eukaryotes.

3. Laboratory diagnosis of Diarrohoea. [15]

4. Laboratory diagnosis of Malaria. [10]

5. **Describe briefly the following:** [3x5=15]
   a. Swarming caused by Proteus.
   b. Quellung reaction.
   c. Cell culture for viral isolation.

6. **Write short notes on the following:** [3x10=30]
   a. Virulence tests for diptheriae.
   b. Anaerobic cocci.
   c. Hydatid disease.

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Basic Cellular pathology & allied techniques

M.M. : 100 **Time : 3 Hours**

Note : Attempt all questions.
Draw diagrams wherever necessary.

1. Enumerate the different Endocrine glands. Discuss the histology of Thyroid glands. [10]

2. Discuss the principles and applications of Dark ground microscope. [10]

3. Describe in detail collection and processing of Sputum specimen. [10]

4. Discuss the histology and functions of the Nephron. [10]

5. What are the different methods to stain amyloid. Discuss the principles and procedure of Congo red stain. [10]

6. What are Metachromatic stains. Describe the procedure of one such staining method. [10]

7. **Write short notes on:**
   a. Stratified Squamous epithelium. [5]
   b. Neuron. [5]

8. **Comment on:**
   a. Myocardium. [5]
   b. Spermatogenesis. [5]

9. **Comment on:**
   a. Maintenance of a Microscope. [5]
   b. Haematoxylin stain. [5]

10. **Write short notes on:**
    a. P.A.S. stain. [5]
    b. Micrometry. [5]

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Analytical Biochemistry & Metabolism

M.M. : 100 **Time : 3 Hours**

Note: *Attempt all questions.*

1. Describe principles and applications of different types of Chromatography. [15]

2. Classify Carbohydrates. Give an account of digestion and absorption of Carbohydrates. What is lactose intolerance. [15]

3. a. Discuss role of Vitamin K in clotting of blood. [7]
   b. Describe Glycogen synthesis. [8]

4. **Write short notes on:** [3x5=15]
   a. Gout.
   b. Hartnup disease.
   c. Essential fatty acids.

5. a. Discuss Urea cycle. [8]
   b. Give an account of Glycogen storage disease. [7]
   c. Determination of Calorific value of food. [5]

6. a. Electrometric determination of Electrolytes. [5]
   b. ELISA. [5]
   c. Diagnostic uses of Isoenzymes. [5]
   d. Marasmus. [5]

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Applied Haemtology

M.M. : 100 **Time : 3 Hours**

Note: ***Attempt all questions.***

1. Describe the laboratory investigations of a patient with immune hemolytic anemia. [15]

2. Describe the principles of automated cell counters. [15]

3. Describe the laboratory tests in a case of Vitamin B12 and folate deficiency. [10]

4. Cytogenetic in acute leukemia. [15]

5. Enumerate the laboratory errors in Leucocyte counts by manual methods and automation. [15]

6. Describe the tests done to evaluate platelet function. [10]

7. **Write short notes on any TWO of the following:** [2x10=20]
   a. LE cell preparation.
   b. Prothrombin time.
   c. Tests for fetal hemoglobin.

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Special Histology & Histochemical methods

M.M.: 100 **Time : 3 Hours**

Note: *Attempt any TEN questions.*

1. Discuss the principles and working of light microscope. [10]
2. Discuss the structure of DNA and methods for its demonstration in tissues. [10]
3. Classification and staining of lipids. [10]
4. Types of histochemical reactions. [10]
5. Write a short note on Ultramicrotomy. [10]
6. Role of ANA in autoimmune disorders. [10]
7. Laboratory diagnosis of autoimmune thyroiditis. [10]
8. Discuss the structure, functions and pathology of IgA[Immunoglobulin A] [10]
9. Detail hormonal assessment of female genital tract. [10]
10. Role of Cytotechnician in FNAC clinics.. [10]
11. Chronic inflammation. [10]
12. Methods of decalcification of tissues for paraffin embedding techniques. [10]

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Clinical Biochemistry methods

M.M. : 100 **Time : 3 Hours**

Note: Attempt all questions.

1. Write normal fasting and PP blood sugar values. Which chemical is added to blood for sugar estimation and why? Enumerate various methods of blood sugar estimation and describe any one of them. [20]

2. a. In which Organ disease, Urea estimation is done? Write its normal value and principle of estimation. [10]
   b. Name the instrument by which you can estimate Serum electrolytes. Why haemolyzed sample should not be used for their estimation? [10]

3. Describe estimation of Serum total proteins and Albumin. In which conditions total serum protein decreases. [20]

4. Write principles of estimation and interpretation of results for ALT, AST, Alkaline phosphatase and CPK. [20]

5. **Write briefly on any TWO of the following:** [2x10=20]
   a. Automation.
   b. Quality control serum and its importance in clinical laboratory.
   c. Creatinine clearance.

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Applied Microbiology

M.M. : 100 **Time : 3 Hours**

Note: ***Attempt all questions.***

1. Enumerate Water borne pathogens and discuss bacteriological analysis of water. [20]

2. Laboratory diagnosis of upper respiratory tract infections. [10]

3. **Write short notes on:**
   a. Widal test. [5]
   b. CRP [C-Reactive Protein] [5]

4. **Write briefly on:**
   a. Candidiasis. [10]
   b. Counter Immuno Electro Phoresis[CIEP] [10]

5. **Write briefly on:**
   a. Viral cell culture. [10]
   b. Pulse Polio [10]

6. **Write short notes on:**
   a. Free living amaebae. [10]
   b. Role of Ticks and Fleas in Parasitic disease/infection in Humans. [10]
