

(LD 148)

OCTOBER 2013

Sub. Code: 2043

**M.D. DEGREE EXAMINATION  
BRANCH XIII- BIOCHEMISTRY**

**PAPER I – PHYSICAL AND ORGANIC ASPECTS OF BIOCHEMISTRY,  
INSTRUMENTATION BIOCHEMICAL TECHNIQUES, BIostatISTICS**

*Q.P. Code: 202043*

**Time: Three Hours**

**Maximum: 100 marks**

**I. Essay:**

**(2X10=20)**

1. Classify centrifugation based on their principles. Discuss the applications of ultracentrifugation.
2. Compare and contrast the concepts of quality control, quality assurance and quality management with context to a clinical laboratory. Discuss proficiency testing in clinical laboratories.

**II. Short Questions:**

**(8x5=40)**

1. Uses of Henderson-Hasselbach equation.
2. Inhibitors of glycoprotein synthesis.
3. Beta alanine formation and its role in the body.
4. Principle of capillary electrophoresis and its uses.
5. Causes and rationale of unfolded protein response.
6. Leukotrienes formation and their postulated role in the body.
7. Modified polynucleotides and their role.
8. Statistical measures of impression.

**III. Reasoning Out:**

**(4x5=20)**

1. What is lactulose? Reason out the rationale of using lactulose in treatment of hepatic encephalopathy.
2. A protein was found to give a single band of molecular weight 'M' on a native polyacrylamide gel electrophoresis. On subsequent treatment of the sample with beta mercaptoethanol, the protein forms 2 bands each of a lower molecular weight than the initial weight 'M'. Reason out the phenomenon observed with examples.
3. A potentially infectious sample needs to be transported to a referral clinical laboratory for analysis. Discuss the key considerations for the transportation of such a sample.
4. Inuit Eskimos have a low incidence of cardiovascular disease when compared to other populations in the rest of the world. Reason out the probable causes with emphasis on their diet.

**IV. Very Short Answers:**

**(10x2=20)**

1. Open and closed systems with regard to chemical reactions.
2. Role of water as a reactant.
3. Rationale of using dextran for therapy.
4. Role and significance of dolichols in the body.
5. Various secondary structure of proteins with examples.
6. Role and function of immunoglobulin M in the body.
7. Explain nucleotide second messengers with examples.
8. Reagent grade water production.
9. Principle of radioimmunoassay.
10. Timed urine collection and its used in the clinical laboratory.

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