Q.P Code

Reg. No.

PG Degree Regular/Supplementary Examinations in Biochemistry (M.D)

Paper I – (Biomolecules, Principles of Biophysics and its biomedical importance, Cell Biology, Fluid , Electrolyte and acid base balance, Analytical techniques and instrumentation, Biostatistics and research methodology, Basics of medical education in teaching and assessment of Biochemistry)

Time : Three Hours **Maximum : 100 Marks**

Essay: **(20)**

1. Describe the structure of cell membrane and explain in detail the different transport mechanisms across the cell membrane

Short Essays **(8 x10 = 80)**

2. Define a systematic review and outline the steps involved in conducting a systematic review.
3. Describe the regulators of cell cycle
4. Discuss the methods used in the validation of diagnostic tests
5. Enumerate the biologically important nucleotides and briefly describe their functions
6. Discuss the principles and applications of Tandem Mass Spectrometry (MS/MS) in clinical and research settings.
7. Discuss the teaching methods used for large and small groups, highlighting their advantages and limitations
8. A 68-year-old woman presents with confusion, nausea, and lethargy. Laboratory investigations reveal: Serum sodium: 125 mmol/L ; Serum Potassium : 4 mmol/L Serum osmolality: 264 mOsm/kg ; Urine sodium: 80 mmol/L ; Urine osmolality: 540 mOsm/kg . Normal renal, thyroid, and adrenal function
   a) Interpret the biochemical abnormalities
   b) Discuss the possible pathophysiology leading to these findings
   c) Outline the laboratory approach to confirm the underlying cause
9. A clinical chemistry section of a hospital central laboratory is evaluating a new biomarker for early detection of acute myocardial infarction (AMI). The test was performed in 220 patients, and the results were compared to the gold standard (troponin assay).
   a) Explain how a Receiver Operating Characteristic (ROC) curve can be used to determine the optimal cut-off.

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b) Interpret an Area Under the Curve (AUC) of 0.92 for this biomarker

c) Discuss the clinical significance of ROC analysis in evaluating diagnostic tests

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