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SVSU/2025/R-B

Enrollment No.

University Examination

MD-Biochemistry

Paper –I

Paper Code: MD-156

(BiomoleculesBiochemistry)

[Time: 3:00 Hours]

[Max. Marks: 100]

Note: Attempt all questions. Draw well-labeled diagrams wherever necessary.

1. (Long Essay)**[20]**

Explain the role of G proteins as signal transduction molecules. List two diseases mediated by altered signalling through heterotrimeric G protein(s) and explain the biochemical basis of the above-mentioned diseases in detail. Enumerate the differences between receptor serine/threonine kinases and tyrosine kinases.

[07+08+05=20]**2. (Short Note)****[4 x 10 = 40]**

- Structural organization of proteins and the principles of protein folding
- structure–function relationship of hemoglobin, highlighting the molecular basis of sickle cell anemia.
- Electrophoresis techniques for protein separation, with their clinical applications.
- Classify Hetero-polysaccharide & mention their biochemical role.

3. (Discuss in brief)**[4 x 10 =40]**

- Biochemical mechanisms of oxidative stress due to environmental toxins and the body's defense mechanisms.
- Describe salvage pathways for purine and pyrimidine metabolism, and discuss disorders associated with defects in these pathways.
- Describe the mechanism of DNA repair, with examples of diseases caused by DNA repair defects
- Explain the different types of research designs with examples. Define bias in research and list methods to reduce it

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University Examination**MD-Biochemistry****Paper –II****Paper Code: MD-157****(Enzymes, and nutrition)****[Time: 3:00 Hours]****[Max. Marks: 100]****Note: Attempt all questions. Draw well-labeled diagrams wherever necessary.****1. (Long Essay)****[20]**

Describe the process of oxidative phosphorylation. Explain the role of mitochondrial membrane proteins in regulating ATP synthesis and discuss the associated diseases.

2. (Short Note)**[4 x 10 = 40]**

- Role of coenzymes and cofactors with one example each
- Ketone bodies and their formation, utilization, and significance.
- Salvage pathway of purine metabolism and clinical importance
- Role of cytochrome P450 in xenobiotic metabolism

3. (Discuss in brief)**[4 x 10 =40]**

- List the coenzyme forms of Vitamin B1 (thiamine) and describe their function.
- Gluconeogenesis and its physiological importance.
- Define protein-energy malnutrition (PEM) and distinguish between marasmus and kwashiorkor.
- Describe briefly heme degradation and its clinical relevance in jaundice.

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University Examination

MD-Biochemistry

Paper -III

Paper Code: MD-158

(Molecular biology,on the body)

[Max. Marks: 100]

[Time: 3:00 Hours]

Note: Attempt all questions. Draw well-labeled diagrams wherever necessary.

1. (Long Essay)

[20]

Explain the molecular basis of cancer with special reference to oncogenes, tumor suppressor genes, mechanisms of activation and hallmark features of cancer.

[07+06+07=20]

2. (Short Note)

[4 x 10 = 40]

- Describe recombinant DNA technology and its applications in medicine and research
- Discuss the biochemical effects of heavy metals (lead, mercury, arsenic) on human health. Explain their mechanisms of toxicity.
- Explain antigen processing and presentation. Add a note on MHC-I and MHC-II.
- Describe mechanisms of hypersensitivity reactions. Write briefly about their clinical relevance.

3. (Discuss in brief)

[4 x 10 =40]

- Discuss the various post-transcriptional modifications in eukaryotes. Add a short note on defects associated with post-transcriptional modifications.
- Define and classify tumour markers. Explain with suitable examples how tumor markers are used in cancer care.
- Describe the process of protein translation in eukaryotes. Enumerate various drugs that inhibit translation in bacteria
- Describe the classification, sources and unique properties of stem cells. Discuss their therapeutic applications in clinical medicine with suitable examples.
