

M.Sc. 1st Semester Examination, 2023

PHYSIOLOGY

(Human Physiology)

PAPER – PHY-101.1 & 101.2

Full Marks : 50

Time : 2 hours

Answer all questions

The figures in the right hand margin indicate marks

Candidates are required to give their answers in their own words as far as practicable

PAPER – PHY-101.1

[Marks : 20]

A . Answer any *two* questions from the following :

1. What is K_{cat} ?

2 × 2

2

2. What is proteolytic cleavage in post-translational modification? 2
3. What is chemiosmotic hypothesis of ATP synthesis? 2
4. What is the driving force for tertiary structure of protein? 2
3. Answer any *two* questions from the following :
 5. What is secondary structure of protein? 4×2
Write down important features of alpha-helix structure of protein. 1 + 3
 6. Demonstrate schematically the course of electron transport through the mitochondrial electron transport chain. What is meant by 'uncoupler' in oxidative phosphorylation? 3 + 1
 7. What is N- and O- linked glycosylation? Describe the involvement of dolichol phosphate in N-linked glycosylation? 1 + 3

8. What is anaplerotic reactions of TCA cycle? State critically the allosteric regulation of TCA cycle by isocitrate-and α -ketoglutarate dehydrogenase enzymes.

1 + 3

C. Answer any *one* question of the following :

8 × 1

9. Write notes on :

(i) Hsp70 as chaperone protein

(ii) Principle of protein folding. 4 + 4

10. What is first-order chemical reaction ?

‘Transition state analogues are more effective competitive inhibitors than product inhibitors’ – Explain with an example. Describe the allosteric regulation of AT Case with special reference to PALA.

2 + 3 + 3

PAPER – PHY-101.2

[Marks : 20]

A . Answer any *two* questions from the following :

1. What is Okazaki fragment ? 2 × 2
2
2. What is co-dominance ? Give an example. 1 + 1
3. What is the Basic Transcriptional Apparatus ? 2
4. What do you mean by pleiotropy ? 2

3. Answer any *two* questions from the following :

5. What do you mean by eukaryotic chromatin compaction ? Mention, the significance of 'highly repetitive sequences' in chromosome. 4 × 2
2 + 2
6. What are the difference between prokaryotic and eukaryotic functional mRNA processing ? Which enzyme is involved in 3' polyadenylation ? 3 + 1

7. Explain the concept of adding up of amino acid to tRNA during translation. What is inborn error of metabolism ? 3 + 1
8. What is Karyotyping ? State the G-banding technique mentioning its importance. 1 + 3

C. Answer any *one* question from the following :

9. Describe the differences in the configurations of B-, Z- DNA. State briefly the process of DNA replication. 8×1 3 + 5
10. Analyze the concept of RNA editing as a modern tool to counter human diseases. What are the marker nucleotides present at 5' and 3' end of an intron ? How the peptide bond forms among the amino acids during elongation ? 4 + 1 + 3

[Internal Assessment — 10 Marks]
