

2018
PHYSIOLOGY – HONOURS

Paper : CC-1

Full Marks : 50

The figures in the margin indicate full marks.

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

Group - A

1. Answer **any five** questions :

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|---|-----|
| (a) What are the functions of smooth endoplasmic reticulum? | 2 |
| (b) What do you mean by 'Karyotyping'? | 2 |
| (c) Distinguish between <i>K</i> and <i>M</i> series allosteric enzymes. | 2 |
| (d) (i) In which phase of meiosis do chromosomes appear beaded and visible? | |
| (ii) Which organelle contains the enzyme catalase? | 1+1 |
| (e) (i) What are the functions of caspases? | |
| (ii) What are ribozymes? | 1+1 |
| (f) Define pleiotropism with example. | 2 |
| (g) What are molecular motors? State their role in cellular functions. | 1+1 |
| (h) Name the cytoskeletal elements found in cell. | 2 |
| (i) What are coenzymes? Give two examples. | 1+1 |
| (j) What are isozymes? Give an example. | 1+1 |

Group - B

Answer **any two** questions

- | | |
|---|-------|
| 2. Write down the electron microscopic structure of Golgi bodies and mention its functions. | 5 |
| 3. (a) Write two important characteristics of rate-limiting enzymes. | |
| (b) How are the parameters V_{\max} and K_m is altered in case of competitive inhibition? | |
| (c) What are abzymes? | 2+2+1 |
| 4. Discuss the structure and functional significance of tight junctions. | 5 |

Please Turn Over

5. (a) Give the names of each stage of mitosis and meiosis at which each of the following events occur :
- (i) Chromosomes are located in a plane at the centre of the spindle.
 - (ii) The chromosomes move away from the spindle equator to the poles.
- (b) What are the major extracellular matrix proteins in connective tissues? 3+2

Group - C

Answer *any three* questions

6. (a) Write down the function of cell membrane.
- (b) Write about the components and organization of eukaryotic ribosomes.
- (c) Write, in brief, the domains of a typical voltage gated ion channel with example. 4+3+(2+1)
7. (a) How is cell cycle regulated by cyclins?
- (b) Distinguish between prophase of mitosis and prophase 1 of meiosis. 5+5
8. (a) What is epistasis? Distinguish between dominant and recessive epistasis.
- (b) What are microsatellite and minisatellite DNA?
- (c) "Linkage and crossing over of genes are alternatives of each other". —Justify the statement.
- (d) What post-translational modifications of histones are associated with transcribed genes (euchromatin) and with repressed genes (Heterochromatin)? (1+2)+2+3+2
9. (a) How is allosteric modulation different from Michaelis-Menten kinetics?
- (b) Define K_m . State its significance.
- (c) How does substrate concentrations affect the rate of an enzyme catalyzed reaction? 2+(2+1)+5
10. (a) Distinguish between ion channels and ionophores.
- (b) Describe the structure and function of inner mitochondrial membrane.
- (c) Explain with an example the reversible covalent modification of enzyme activity. 3+4+3
11. (a) What is steady state approximation?
- (b) Derive Michaelis-Menten equation on the light of steady state assumptions.
- (c) What do you mean by "Lineweaver-Burk" Plot? 3+5+2