

2024

**ZOOLOGY — HONOURS**

**Paper : DSCC-1**

**(Cell Biology)**

**Full Marks : 75**

*The figures in the margin indicate full marks.*

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

**Section - A**

1. Answer *any ten* questions :

2×10

- (a) Distinguish between v-onc and c-onc.
- (b) Which organelle is referred as the 'traffic police' of the cell and why?
- (c) What is facilitated diffusion?
- (d) Mention difference between SER and RER.
- (e) What do you mean by resolution of a microscope?
- (f) What is glycocalyx?
- (g) Define cis-trans polarity of Golgi complex.
- (h) Define carcinogens with example.
- (i) Mention the role of APC/C.
- (j) Define transmembrane protein with suitable example.
- (k) What do you mean by second messenger? Give one example.
- (l) What are Nucleoporins?
- (m) Define obligatory heterochromatin. Give one example.
- (n) Mention two pro-apoptotic and two anti-apoptotic proteins.
- (o) Name any two enzymes associated with inner mitochondrial membrane.

**Section - B**

2. Write short notes on *any three* of the following :

5×3

- (a) Structure and function of  $F_0-F_1$  Particle
- (b) Centrosome and its organization
- (c) RTK (ras-raf) pathway

**Please Turn Over**

- (d) Subcellular fractionation and Ultracentrifugation
- (e) Principle of Scanning Electron Microscope (SEM).

### Section - C

Answer *any four* questions.

3. (a) Briefly discuss the fluid-mosaic model of plasma membrane with diagram.  
(b) What are Lipid rafts?  
(c) Write a note on polymorphism of lysosomes. (3+2)+2+3
  4. (a) What do you mean by glycosylation of proteins? Briefly discuss the process of N-linked glycosylation with suitable diagram.  
(b) What do you mean by respiratory poisons? Give one example.  
(c) Distinguish between light microscope and electron microscope. (1+4)+(1+1)+3
  5. (a) Discuss the composition and function of different types of intermediate filaments.  
(b) Write a brief note on zonula occludens.  
(c) What are GAGs? (3+2)+3+2
  6. (a) Write down the structural features of microtubules.  
(b) What are the functions of ECM?  
(c) Distinguish between Euchromatin and Heterochromatin. 3+3+4
  7. (a) Describe the 'Beads on a string' model of chromatin with diagram.  
(b) Explain how MPF regulates the progression of cell cycle from G2 to M phase with diagram.  
(c) What is Knudson's Two Hit hypothesis? (3+1)+(3+1)+2
  8. (a) Describe the intrinsic pathway of apoptosis with suitable diagram.  
(b) What are caspases? What is the reason behind the nomenclature 'caspase'?  
(c) Distinguish between cell surface receptors and cytosolic receptors with examples. (4+1)+(2+1)+2
  9. (a) What is the principle of FRET?  
(b) Calculate the minimum limit of resolution possible for a light microscope, if maximum value of numerical aperture is 1.10 and wavelength of light is 480 nm.  
(c) Discuss the properties of cancer cells. 3+3+4
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