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Question Paper Code: R2D05

B.E./B.Tech. DEGREE EXAMINATION, APRIL 2024

Second Semester

Biotechnology

R21UBT205- **CELL BIOLOGY**

(Regulations R2021)

Duration: Three hours

Maximum: 100 Marks

Answer All Questions

PART A - (10 x 1 = 10 Marks)

- Which of the following cell organelles is absent in animal cells and present in a plant cell? CO1 -U
(a) Cell wall (b) Cytoplasm (c) Vacuole (d) Ribosome
- Transmembrane proteins are..... CO1 -U
(a)Hydrophilic only (b) Hydrophobic only (c) Hydro only (d) None of these
- Semipermeable membrane allows _____ CO1 -U
(a) Solute to pass (b) Solvent to pass (c) Solution to pass (d) Proteins to pass
- During muscle contraction CO1 -U
(a) Ca^{2+} ion concentration in the cytoplasm decreases
(b) Ca^{2+} ions binds with troponin
(c) tropomyosin interacts tightly with actin filaments
(d) Ca^{2+} ion influx to sarcoplasmic reticulum occurs
- _____ is a form of cell division which results in the creation of gametes or sex cells. CO1 -U
(a) Meiosis (b) Mitosis (c)Miosis (d) None of the above
- Synapsis is defined as the pairing of _____ CO1 -U
(a) Non-homologous chromosomes (b) Homologous chromosomes
(c) Any chromosomes (d) Sex Chromosomes

7. Steroids, a biologically active organic compound, are derived from _____. CO1 -U
 (a) Hormones (b) Chemicals (c) Carbohydrates (d) Cholesterol
8. The hormone, also called the ligand is considered as _____. CO1 -U
 (a) First messenger (b) Second Messenger
 (c) Both (a) and (b) (d) None of the above
9. Electron Microscope can give a magnification up to ____ CO1 -U
 (a) 400,000X (b) 100,000X (c) 15000X (d) 100X
10. Which fluorescent dye can be used for red fluorescence? CO1 -U
 (a) Rhodamine (b) Fluorescein (c) Carmine (d) DAPI

PART – B (5 x 2= 10Marks)

11. Generalize the function of Golgi bodies CO1 -U
12. Summarize the tonicity concept in water movement CO1 -U
13. Classify the stages of meiosis CO1-U
14. Predict the role of G proteins in a signaling pathway CO1-U
15. ‘Confocal microscopy is not an acceptable tool for nuclear level study’. Restate CO2-App

PART – C (5 x 16= 80 Marks)

16. (a) Predict structure and functions of various cellular organelles present in the eukaryotic cells with neat diagram CO1-U (16)
 Or
 (b) Elaborate extracellular matrix and the cell-cell junction CO1-U (16)
17. (a) Interpret, how does the Sodium-Potassium pumps and Calcium pumps contribute to net negative charge of the interior of the cell CO2 App (16)
 Or
 (b) Discover the roles of Ca^{2+} ATPase and Na^+/K^+ ATPase in the movement of ions across the cell membrane CO2 App (16)
18. (a) Summarize the pathways involved in apoptosis and its importance. CO1-U (16)
 Or
 (b) Explain cancer and highlighting the properties of cancer cells CO1-U (16)

19. (a) Explain amplification in regard to signal transduction. How does the use of a reaction cascade result in amplification of a signal? How does it increase the possibilities for metabolic regulation? CO2 App (16)
- Or
- (b) Correlate the involvement of second messengers in the cell signalings. CO2 App (16)
20. (a) Explain Immunostaining and the limitations in this technique CO1-U (16)
- Or
- (b) Explain the difference between bright field microscope and confocal microscope. Highlight this with suitable example CO1-U (16)

