Reg.No. \_\_\_\_\_\_\_\_\_\_\_\_



**UNIVERSITY**

(Karunya Institute of Technology & Sciences)

(Declared as Deemed-to-be University under Sec.3 of the UGC Act, 1956)

**End Semester Examination – Nov/Dec – 2016**

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|  |  | **Semester :** | **2016-17 ODD** |
| **Code :** | **14BT2004** | **Duration :** | **3hrs** |
| **Sub. Name :** | **CELL BIOLOGY** | **Max. marks :** | **100** |

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| **Q. No.** | **Questions** | | | | | | | | | | | **Course outcome** | | **Mark** |
| **PART-A (40X1=40 MULTIPLE CHOICE QUESTIONS)** | | | | | | | | | | | | | | |
| 1. | **Which of the following correctly matches an organelle with its function?** | | | | | | | | | | | | CO 1 |  |
|  | a. **Mitochondrion . . . photosynthesis** | | | b. **Nucleus . . . cellular respiration** | | | c. **Ribosome . . . manufacture of lipids** | | | | d. **Central vacuole . . . storage** | |  | (1) |
| 2. | **The structure within a cell that distinguishes the cell as being eukaryotic, and prokaryotic is** | | | | | | | | | | | | CO 1 |  |
|  | a. **Ribosomes** | | | b. **Cell membrane** | | | c. **Cell wall** | | | | d. **Nucleus** | |  | (1) |
| 3. | **The transport vesicles from the** [**Endoplasmic Reticulum**](http://en.wikipedia.org/wiki/Endoplasmic_Reticulum) **(ER) fuse with the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ face of the Golgi apparatus.** | | | | | | | | | | | | CO 1 |  |
|  | a. Cis | | | b.Trans | | | c. Coated | | | | d.Median | |  | (1) |
| 4. | **Plant cells contain the following 3 structures not found in animal cells** | | | | | | | | | | | | CO 1 |  |
|  | a. **Plastids / Chlorophyll / Membrane** | | | b. **Chloroplast / Cell wall / Golgi body** | | | c. **Plastids / Cell wall / Chlorophyll** | | | | d. **Mitochondria / Cell wall /** Bottom of Form  nucleus | |  | (1) |
| 5. | Which of the following is NOT true concerning cytoskeletal elements? | | | | | | | | | | | | CO 2 |  |
|  | a. Cilia are small extensions of membrane surrounded microtubules. | | | b. Intermediate filaments compose flagella | | | c. Flagella have a 9 + 2 pattern of microtubule structure. | | | | d. Basal bodies are located at the base of cilia and flagella. | |  | (1) |
| 6. | The spindle formation is observed during ------------------- phase of the cell cycle | | | | | | | | | | | | CO 2 |  |
|  | a. G1 | | | b. G2 | | | c. S | | | | d. M | |  | (1) |
| 7. | The cytoskeletal elements which forms nuclear lamina is | | | | | | | | | | | | CO 2 |  |
|  | a. Microtubules | | | b. Microfilaments | | | c. Intermediary filaments | | | | d. None of the above | |  | (1) |
| 8. | Actin filaments are | | | | | | | | | | | | CO 2 |  |
|  | a. also known as microtubules. | | | b. able to associate with motor proteins in muscular contraction. | | | c. found in the center of flagella and cilia. | | | | d. intermediate in size between microtubules and microfilaments. | |  | (1) |
| 9. | Gases such as oxygen and carbon dioxide cross the plasma membrane by | | | | | | | | | | | | CO 3 |  |
|  | a. secondary active transport proteins | | | b. passive diffusion through the lipid bilayer | | | c. specific gas transport | | | | d. primary active transport | |  | (1) |
| 10. | Endocytosis is used by cells to | | | | | | | | | | | | CO 3 |  |
|  | a. Ingest bacteria and cell debris | | | b. Retrieve elements of the plasma membrane after exocytosis | | | c. Secrete large molecules into the extracellular space | | | | d. is always employed by cells for secretion | |  | (1) |
| 11. | From soil, inorganic ions can be loaded in root hair through | | | | | | | | | | | | CO 3 |  |
|  | a. Diffusion | | b. Active transport | | c. partial osmosis | | | | d. Differential osmosis | | | |  | (1) |
| 12. | The following membrane transport methods does not require protein channels/ carriers except | | | | | | | | | | | | CO 3 |  |
|  | a. Osmosis | | | b. Phagocytosis | c. Facilitated diffusion | | | | | | d. Exocytosis | |  | (1) |
| 13. | The pH inside the lysosomes is | | | | | | | | | | | | CO 3 |  |
|  | a. Acidic | | | b. Alkaline | | | c. Neutral | | | | d. Buffered | |  | (1) |
| 14. | Gap junctions | | | | | | | | | | | | CO 2 |  |
|  | a. permit the passage of large proteins from cell to cell | | | b. form part of the classical junctional complex | | | | c. exist only between epithelial cells | | | d. are areas of low resistance for nerve stimulation | |  | (1) |
| 15. | Hemidesmosomes are connections between | | | | | | | | | | | | CO 2 |  |
|  | a. Cell to cell | b. Cell to internal organ | | | | c. Cell to matrix | | | | d. Cell to cell membrane | | |  | (1) |
| 16. | Which of the following statement is true about Na+K+ ATPase | | | | | | | | | | | | CO 3 |  |
|  | a. Move Na+ and K+ out of the cell | | | b. Move Na+ and K+ inside the cell | | | c. Move Na+ out and K+ inside | | | | d. Move K+ out and Na+ inside | |  | (1) |
| 17. | In paracrine signaling, the signaling molecules affect only | | | | | | | | | | | | CO 4 |  |
|  | a. Target cells close to the cell which is secreted | | | b. Target cells far away from the site of synthesis | | | c. Target cells on the same cells of synthesis | | | | d. Both B and C | |  | (1) |
| 18. | Which of the following is not the Primary messenger of cell signaling | | | | | | | | | | | | CO 4 |  |
|  | a. Insulin | | | b. Testosterone | | | c. Thyroxine | | | | d. Adenylate cyclase | |  | (1) |
| 19. | The enzyme which splits PIP2 to Inositol triphosphate and Diacyl glycerol is | | | | | | | | | | | | CO 4 |  |
|  | a. Phosphokinase C | | | b. Phosphorylase C | | | c. Phospholipase C | | | | d. Lipokinase | |  | (1) |
| 20. | The following statements about G protein coupled receptors are correct except | | | | | | | | | | | | CO 4 |  |
|  | a. They are involved in signal cascades | | | b. They become activated when GDP is bound | | | c. They are seven transmembrane helical proteins | | | | d. They are bound to trimeric G protein | |  | (1) |

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| 21. | Name the enzyme activated by transducin (Gtα) | | | | | | | | | | | CO 4 |  | |
|  | a. Adenylate cycalse | b. Phospholipase C | | | c. cGMP phosphodiesterase | | | d. Protein Kinase | | | |  | (1) | |
| 22. | Aspirin reduces inflammation and pain by inhibiting ----------- enzyme in the synthesis of the prostaglandins | | | | | | | | | | | CO 4 |  | |
|  | a. Quanylyl cycalse | b. Phosphorylase kinase | | | c. Glycogen syntase | | | d. Cyclooxygenase 2 | | | |  | (1) | |
| 23. | Gibberlin is an example of | | | | | | | | | | | CO 4 |  | |
|  | a. Neurotransmitter | | | b. Plant growth hormone | | | c. Neuropeptides | | | d. Steroid hormone | |  | (1) | |
| 24. | Name the enzyme which can modify the activity of a protein by addition of phosphate group | | | | | | | | | | | CO 4 |  | |
|  | a. Phosphatase | b. cAMP | | | c. Protein kinase | | | d. G protein | | | |  | (1) | |
| 25. | What is the membrane potential in resting cells? | | | | | | | | | | | CO 3 |  | |
|  | a. -50mV to -70mV | b. -90 mV to -100 mV | | | c. +30 mV to +60 mV | | | | d. +60 mV to +80 mV | | |  | (1) | |
| 26. | Acetyl choline receptor located in the synaptic cleft is | | | | | | | | | | | CO 3 |  | |
|  | a. Ligand gated Sodium channel | | b. Ligand gated Calcium channel | | | c. Voltage gated Sodium channel | | | d. Voltage gated Potassium channel | | |  | (1) | |
| 27. | How many molecules of Glucose are transported by Na Glc symporter | | | | | | | | | | | CO 3 |  | |
|  | 1. 2 | 1. 3 | | | 1. 4 | | | d. 5 | | | |  | (1) | |
| 28. | Na+ K+ ATPase is an example of | | | | | | | | | | | CO 3 |  | |
|  | a. Antiport | b. Symport | | | c. Uniport | | | d. ABC | | | |  | (1) | |
| 29. | What is the effect of Nitroglycerin? | | | | | | | | | | | CO 4 |  | |
|  | a. Relaxes smooth muscle | b. Contracts smooth muscle | | | c. Inhibitor of Guanylyl cycalse | | | d. Activates Diesterase | | | |  | (1) | |
| 30. | All the following statements on calcium signaling are true except | | | | | | | | | | | CO 4 |  | |
|  | a. Activates calcium calmodullin Kinase | | | b. Inhibits actin myosin interaction | | c. Helps in aggregation of blood platelets | | | | d. Inhibits exocytosis of enzymes in pancreatic cells | |  | (1) | |
| 31. | Retroviruses code for -------------- enzyme which convert RNA to DNA | | | | | | | | | | | CO 3 |  | |
|  | a. Replicase | b. Polymerase | | | c. Reverse transcriptase | | | d. Helicase | | | |  | (1) | |
| 32. | Which is the most fastest mean of transport | | | | | | | | | | | CO 3 |  | |
|  | a. Passive diffusion | b. Facilitated diffusion | | | c. Channel proteins | | | d. Carrier proteins | | | |  | (1) | |
| 33. | Which of the following terms is used to describe a membrane protein capable of moving substances from a low to a high concentration? | | | | | | | | | | | CO 3 |  | |
|  | a. Transporter | b. Pump | | | c. Diffuser | | | d. Oxidiser | | | |  | (1) | |
| 34. | The transport which involves conformational change during transport | | | | | | | | | | | CO 3 |  | |
|  | a. Ion channels | b. Osmosis | | | c. Passive diffusion | | | d. Carrier proteins | | | |  | (1) | |
| 35. | Calmodullin is a protein that regulates the level of ------- ion inside the cytoplasm | | | | | | | | | | | CO 4 |  | |
|  | a. Na+ | b. Ca2+ | | | c. K+ | | | d. Cl- | | | |  | (1) | |
| 36. | The major biomolecule that is responsible for uptake of materials across plasma membrane is | | | | | | | | | | | CO 3 |  | |
|  | a. Protein | b. Carbohydrate | | | c. Phospholipids | | | d. Lipids | | | |  | (1) | |
| 37. | What is the immediate source of energy for active transport? | | | | | | | | | | | CO 3 |  | |
|  | a. carbohydrates | b. lipids | | | c. ATP | | | d. amino acid | | | |  | (1) | |
| 38. | Eukaryotic cells have transport vesicles, endoplasmic reticulum, Golgi apparatus and a nuclear envelope. Taken together, all these membranes represent the | | | | | | | | | | | CO 1 |  | |
|  | a. transfer system | b. nuclear system | | | c. endomembrane system | | | d. cytoskeletal system | | | |  | (1) | |
| 39. | Diptheria toxin is an example of | | | | | | | | | | |  |  | |
|  | a. Exotoxin | b. Endotoxin | | | c. Exozymes | | | d. None of the above | | | | CO 3 | (1) | |
| 40. | Which of the following is a cell adhesion molecule | | | | | | | | | | | CO 2 |  | |
|  | a. Integrin | b. Lysin | | | c. Myosin | | | d. Keratin | | | |  | (1) | |
| **PART B(8 X 5 = 40 MARKS) (ANSWER ANY EIGHT)** | | | | | | | | | | | | | | |
| 41. | Brief on the organization of mitochondria with a neat diagram. Add a note on its functions. | | | | | | | | | | CO 1 | | | (5) |
| 42. | Differentiate Prokaryotic and Eukaryotic cell. | | | | | | | | | | CO 1 | | | (5) |
| 43. | Compare and contrast Microtubules and Microfilaments. | | | | | | | | | | CO 2 | | | (5) |
| 44. | Tabulate the differences between passive diffusion and facilitated diffusion. | | | | | | | | | | CO 3 | | | (5) |
| 45. | Brief on various cell adhesion molecules and cell junctions. | | | | | | | | | | CO 2 | | | (5) |
| 46. | Hormones that activate a receptor coupled to Gs stimulate the proliferation of thyroid cells. How would inhibitors of cAMP phosphodiesterase affect the proliferation of cells. | | | | | | | | | | CO 4 | | | (5) |
| 47. | What are G proteins? How do they influence signaling. | | | | | | | | | | CO 4 | | | (5) |
| 48. | Comment on different types of cell signaling. | | | | | | | | | | CO 4 | | | (5) |
| 49. | Give an account on Steroid receptors. | | | | | | | | | | CO 4 | | | (5) |
| 50. | How does rod cells promote light vision? | | | | | | | | | | CO 4 | | | (5) |
| **PART C( 2 X 10 = 20 MARKS) (ANSWER ANY TWO)** | | | | | | | | | | | | | | |
| 51. | With a neat diagram, explain the function of Na+K+ pump. How does the pump help to maintain the osmotic balance of the cell. | | | | | | | | | | CO 3 | | | (10) |
| 52. | Draw the structure of cAMP. Substantiate the role of cAMP as second messenger with suitable explanation. | | | | | | | | | | CO 4 | | | (10) |
| 53. | Name the phases of cell cycle and its major features of each phase and molecules that control cell cycle. | | | | | | | | | | CO 1 | | | (10) |

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