LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

M.Sc. DEGREE EXAMINATION – **BIOTECHNOLOGY**

SECOND SEMESTER – **APRIL 2015**

BT 2955 - CELL SIGNALING

Date : 25/04/2015 Dept. No. Max. : 100 Marks
Time : 01:00-04:00

PART – A **(20 Marks)**

Answer ALL the questions

I Choose the correct answer: **(5 x 1 = 5 marks)**

1. G proteins are found in

a) Eukaryotes b) prokaryotes c) flagella d) nucleus

2. Tight junctions connect the _____of adjacent cells.

a) Cytoplasm b) Nucleus c) Plasma membrane d) Ribosomes

3. Increased concentration of which ion triggers immediate release of acetylcholine?

a) Cl^- b) K^+ c) Ca^+ d) P^+

4. Which of the following protease involved in apoptosome formation?

a) Caspase 3 b) Caspase 6 c) Caspase 7 d) Caspase 9

5. Among the following, which is not true about chromatin remodelers?

a) They regulate transcription b) Require ATP to function

c) Simple monomeric units d) Controls promoter position

II State whether the following are true or false, if false, give reason **(5 x 1= 5 marks)**

6. Adherens junctions connect the actin filaments of neighbouring cells.

7. Estrogen is a hydrophilic molecule that can pass through the lipid layer of membranes.

8. Transient receptor potential is not found on the nucleus.

9. Bcl-2 is an anti-apoptotic protein.

10. DNase I foot printing cannot be used to analyze transcriptional activators.

III Complete the following: **(5 x 1 = 5 marks)**

11. _____molecules carries the cellular response of the signaling pathway.

12. Plant cells communicate through openings in their cell walls called _____.

13. Tetrodotoxin affects the function of _____ ion channel.

14. Mek belongs to _____ family of proteins.

15. Wilm's tumor gene is preferentially expressed in _____.

IV Answer the following, each within 50 words only **(5 x 1 = 5 marks)**

16. List the major types of signaling mechanisms found in multicellular organisms.

17. What is the role of scaffolding proteins?

18. Mention the technique used to measure the ion channel potential.

19. Name the toll like receptor associated with flagellin.

20. Define chromatin remodeling.

PART – B

Answer the following questions, each in about 500 words only. Draw diagrams wherever necessary. **(5×8 = 40 marks)**

21. (a) Discuss the role of cAMP and Ca^{++} as second messengers.

(OR)

(b) Give a brief account of the various molecules involved in the formation of cell junctions.

22. (a) Classify and briefly describe the different types of receptor molecules.

(OR)

(b) Explain signal transduction pathway.

23. (a) Outline the mechanism of action of muscarinic receptors

(OR)

(b) Explain the signal transduction associated with human rod cells.

24. (a) Examine the role of Toll like receptors in immune response

(OR)

(b) Summarize the steps involved in insulin receptor signaling with illustration.

25. (a) Write short notes on:

i) Chromatin remodelers ii) Repressors

(OR)

(b)Explain a technique to study cell signaling components.

PART – C

Answer any TWO of the following questions, each in about 1500 words; Draw diagrams wherever necessary. **(2×20 = 40 marks)**

26. Explain in detail the basic structure and function of gap junctions.
27. Write in detail on GPCR signaling and its regulation by receptors.
28. Describe the different types and structure of ion channels with two examples.
29. Describe any two apoptotic signaling pathways.

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