LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

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

FIRST SEMESTER – NOVEMBER 2017

17/16PBT1MC01 - CELL AND DEVELOPMENTAL BIOLOGY

Date: 02-11-2017 Dept. No. Max. : 100 Marks
Time: 01:00-04:00

PART – A
Answer ALL the Questions

I. Choose the correct answer (5 x 1 = 5 Marks)

1. What is the magnification power of an electron microscope?
   a) 10,000 X b) 100 X c) 10,00 X d) 100,000X
2. Receptor is always a _____
   a) Protein b) lipid c) Fatty acid d) CHO
3. Which is the following is the stem cell of an egg?
   a) Oogonia b) Ootid c) Ovum d) Yolk
4. In which of the following segment is antennapedia expressed?
   a) First b) second c) third d) fourth
5. What does SAM stand for?
   a) Shoot Apical Meristem b) Stem Apical Meristem
   c) Side Apical Meristem d) Strong Apical Meristem

II. State whether the following are true or false. (5x1=5 Marks)

6. Two daughter cells are seen in telophase.
7. Secondary messengers are seen only in G-protein mediated signal transduction.
8. *C. elegans* is a good model system to study the cell lineage in an eukaryote.
9. *Hox* genes are homologous to Homeotic selector genes.
10. Pattern formation can be studied in the embryo formation of a seed.

III. Complete the following (5 x 1= 5 Marks)

11. Chloroplast DNA is of _____ origin.
12. 40% of the extracellular matrix composed of _____.
13. _____ has got communicating function between cells.
14. _____ destroys the maternal mRNA in *Drosophila*.
15. _____ _____allows solute and electrical current to pass through between cells.

IV. Answer the following within 50 words (5 x 1 = 5 Marks)

16. Mention any one function of cell dependant kinase (cdk)
17. What are cell adhesion molecules?
18. Define commitment of cells in humans
19. What are energids?
20. On which day of foetal development a human blastoceal is formed?

PART B

Answer the following each within 500 words. Draw diagrams and flowcharts wherever necessary.
(5 x 8 = 40 marks)

21. a) Compare and contrast mitosis and meiosis.

OR

(b) Describe stages of a cell cycle and discuss its regulation.

22. (a) Explain the cell signaling pathway, where secondary messengers are involved.

OR

(b) Discuss Erythropoetin (EPO) signaling.

23. (a)Describe the steps in the formation of a human blastocyst.

OR

(b) Explain how an embryosac is formed?

24. (a) Write an account on:

i. Sex determination in Drosophila ii. Dosage compensation in humans

OR

(b) Explain vulval induction in *C.elegans*

25. (a) Discuss the structure and function of Shoot Apical Meristem (SAM).

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OR

(b) Distinguish between a monocot and dicot.

PART – C

Answer any TWO of the following, each within 1500 words. (2 x 20 = 40 Marks)
Draw diagrams wherever necessary.

26. Write in detail about cytoskeleton
27. Describe two types of receptors.
28. Explain fertilization and dorsal ventral patterning in Drosophila.
29. Describe Oogenesis in humans.

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