LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

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

FIRSTSEMESTER – APRIL 2018

17/16PBT1MC01- CELL AND DEVELOPMENTAL BIOLOGY

Date: 25-04-2018 Dept. No. Max. : 100 Marks
Time: 09:00-12:00

PART – A

Answer ALL the Questions

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

1. During which phase of cell cycle does replication happen
   a) G_0 b) G_1 c) M d) S
2. Which among the following transports ions to adjacent cells?
   a) Gap junctions b)Periplasm
   c) Microtubules d) Plasmojunctions
3. Epiblast is formed from
   a)ICM b) ECM c)Spermatid d)Acrosome
4. In which of the following segments of Drosophila is antennapedia expressed?
   a)1^{st} b) 2^{nd} c)3^{rd} d)4^{th}
5. Microspores are found within which of the following
   a) Ovary b) Ovule c) Pollen d) Megaspore

II. State whether the following are True or False. **(5x1=5 Marks)**

6. The ATP synthase is located at the matrix of mitochondria.
7. The cell surface receptors are signaled by proteins.
8. Extra cellular mass is made of protein and carbohydrates.
9. *C.elegans* is a hermaphrodite.
10. Arabidopsis thaliana has a very short lifecycle.

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

11. _____is a process by which the cell digests its own contents.
12. _____ is a complex network of proteins and carbohydrates outside the cell.
13. _____ are molecules that aid in oocyte maturation
14. Islands of nuclei surrounded by cytoplasm during drosophila are _____.
15. _____ meristem is responsible for growth and elongation of roots.

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

16. What are cyclin dependent kinases?
17. Give an example for cell surface receptor.

18. Define commitment.

19. Which is the site of sperm entry in *Drosophila?*

20. Mention the two proteins of two component signaling?

PART B

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

21. (a) Comment on cell cycle regulation.

OR

(b) Describe the structure and function of Plasma membrane.

22. (a) Write an account on cell adhesion molecules.

OR

a) Explain bacterial two component signaling.

23. (a)Write notes on: i. Stem cells ii. Genomic equivalence.

OR

(b) Explain cleavage of human zygote.

24. (a) Write about vulval induction in *C. elegans*.

OR

(b) Discuss sex determination in Drosophila.

25. (a) Outline Hammmerlings experiment on A*cetabulari*a.

OR

(b)Write about seed coat development.

PART – C

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

26. Describe Ras to MAPK pathway in insulin signaling.

27. Write in detail about Oogenesis.

28. Explain fertilization in Drosophila melanogaster.

29. Examine the structure and function of root apical meristem and shoot meristem.