LOYOLA COLLEGE (AUTONOMOUS) CHENNAI – 600 034

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

FIRST SEMESTER – **NOVEMBER 2024**

PBT1MC01 – CELL BIOLOGY AND MOLECULAR GENETICS

Date: 08-11-2024 Dept. No. Max. : 100 Marks

Time: 01:00 pm-04:00 pm

	SECTION A – K1 (CO1)
	Answer ALL the questions **(5 x 1 = 5)**
1	**Choose the best option**
a)	Stroma is the ground material found in i) Peroxisome ii) ER iii) Chloroplast iv) Nucleus
b)	Why would *Vibrio fischeri* only activate its bioluminescence only after specific amount of cells being present? i) They check how many bacteria other than them are present. ii) Cell that has gone through mitosis announces how many cells are there. iii) They react the death of one bacteria causing a chain reaction. iv) They use released hormones to check how many bacteria are present.
c)	Select one of the statement which could be true of the integral membrane proteins? i) They lack tertiary structure. ii) They are loosely bound to the surface of the bilayer. iii) They are usually trans membrane proteins. iv) They are not mobile within the bilayer.
d)	Which genetic phenomenon explains the inheritance of traits in a dominant-recessive manner? i) Co-dominance ii) Incomplete dominance iii) Mendelian inheritance iv) Polygenic inheritance
e)	Epigenetics is the study of: i) Changes in the DNA sequence. ii) Changes in gene expression that are not caused by changes in the DNA sequence. iii) The inheritance of traits. iv) The structure of chromosomes.
	SECTION A – K2 (CO1)
	Answer ALL the questions **(5 x 1 = 5)**
2	**Answer in one or two sentences**
a)	List the stages in mitosis.
b)	Define signal transduction.
c)	What is protein packaging?
d)	Differentiate DNA and RNA.
e)	Comment on the importance of GC content in DNA.

	SECTION B – K3 (CO2)	
	Answer any THREE of the following	**(3 x 10 = 30)**
3	Outline about the cell cycle checkpoints.	
4	Identify the signaling pathway in bacteria and explain the mechanism.	
5	Defend the statement that stromatolites have an important role in evolution of life	
6	Sketch the key milestones in Human Genome Project.	
7	Relate post translation modifications for a functional protein.	
	SECTION C – K4 (CO3)	
	Answer any TWO of the following	**(2 x 12.5 = 25)**
8	Cytoskeleton is the driving force behind functioning of cell. Substantiate the statement.	
9	Explain the types of cell junctions in animals.	
10	Outline the steps involved in DNA repair mechanism.	
11	Illustrate and discuss the organization of genetic material.	
	SECTION D – K5 (CO4)	
	Answer any ONE of the following	**(1 x 15 = 15)**
12	Discuss the salient features of fluid mosaic model with illustration.	
13	a) Hedgehog signaling pathway is involved in embryogenesis and tumorigenesis- Justify. b) Illustrate SNARE hypothesis.	
	SECTION E – K6 (CO5)	
	Answer any ONE of the following	**(1 x 20 = 20)**
14	Outline in detail a genetic disorder with clinical manifestations, screening assay, lod score and associated ethical, legal, and social issues. Develop preventive measures for the disorder and share insights.	
15	Design a flowchart to summarize the molecular events involved in DNA replication and its types.	

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