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GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER– III (New) EXAMINATION – WINTER 2019

Subject Code: 3130406

Date: 30/11/2019

Subject Name: Cell Biology

Time: 02:30 PM TO 05:00 PM

Total Marks: 70

Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

		Marks
Q.1	(a) What are Plasmodesmata and what are their functions?	03
	(b) Explain the fluid mosaic model with a diagram	04
	(c) Differentiate between the Nucleoid and the Nucleus, and write a short note on Plasmids	07
Q.2	(a) What are the functions of the cytoskeleton.	03
	(b) Enlist all prokaryotic vesicles and explain the function of gas vesicles.	04
	(c) Compare the role of eicosanoids and steroid/lipid signal molecules.	07
	OR	
	(c) Compare the cell wall structure of gram positive and gram negative cell walls	07
Q.3	(a) Mitochondria are responsible for generation of energy in the eukaryotic cell. Which organelle is responsible for energy generation in prokaryotes similarly.	03
	(b) Write notes on Chemotaxis and Phototaxis	04
	(c) Explain the secretory pathway for proteins with respect to the roles of endoplasmic reticulum and golgi complex.	07
	OR	
Q.3	(a) How does the JAK/STAT pathway regulate cell functions.	03
	(b) Explain how RAS protein malfunction leads to cancer.	04
	(c) What are non receptor tyrosine kinases explain with the example of cytokine receptors.	07
Q.4	(a) Draw a labeled diagrams of eukaryotic cell cycle phases and events of M phase.	03
	(b) You have a mixed population of cells and through a Fluorescent assisted cell sorter, you find out that 47% of the cells have double the DNA of the rest of the cells. What percentage of cells are in G1 phase? Justify your answer in a single paragraph.	04
	(c) Explain the process of lysosome maturation	07
	OR	
Q.4	(a) Define apoptosis and Gap junctions	03
	(b) Write a note on Chloroplasts and evaluate which of the prokaryotic organelles is responsible for the function of chloroplasts	04
	(c) Elaborate on different modes of cell signalling with example of signal molecules.	07
Q.5	(a) What do you understand by the term akaryotic? give two examples of the same.	03
	(b) Explain G-protein coupled receptors with diagram.	04

(c) Explain the hierarchy of life from the basic unit of life to the whole biosphere. **07**

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OR

- Q.5**
- (a) What are stem cells? How is Nitro glycerine used for immediate treatment of heart attack? **03**
 - (b) Evaluate and explain what would happen with respect to cell division if there is DNA break during the G1, S, or G2 phase. **04**
 - (c) Write a note on the apoptotic caspases and evaluate the effect of a defective P53 gene on the cell **07**

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