

Enrollment No./Seat No.:

GUJARAT TECHNOLOGICAL UNIVERSITY
Bachelor of Engineering - SEMESTER - III EXAMINATION - WINTER 2025

Subject Code: 3130406

Date: 15-12-2025

Subject Name: Cell Biology

Time: 10:30 AM TO 01:00 PM

Total Marks: 70

Instructions

- 1. Attempt all questions.**
- 2. Make suitable assumptions wherever necessary.**
- 3. Figures to the right indicate full marks.**
- 4. Simple and non-programmable scientific calculators are allowed.**

	Marks
Q.1 (a) Differentiate between akaryotic, prokaryotic, and eukaryotic cells	03
(b) Explain briefly the concept of the origin and evolution of cells.	04
(c) Write the structure and function of the bacterial cell wall.	07
Q.2 (a) What are plasmids? Mention their significance.	03
(b) Write short notes on endospore and its importance.	04
(c) Explain the structural organization of a bacterial cell with a neat labeled diagram.	07
OR	
(c) Discuss microbial locomotion and the mechanisms involved.	07
Q.3 (a) Differentiate between rough and smooth endoplasmic reticulum.	03
(b) Write short notes on lysosomes.	04
(c) Discuss the role of mitochondria and plastids in energy metabolism.	07
OR	
(a) What is the role of the Golgi apparatus in protein processing?	03
(b) Define cytoskeleton and state its components.	04
(c) Describe the structure and functions of cell junctions in eukaryotic cells.	07
Q.4 (a) Describe the structure of the nucleus.	03
(b) Write a short note on plasmodesmata.	04
(c) Describe the eukaryotic cell cycle and explain how it is regulated by internal and external factors.	07
OR	
(a) What are cell cycle checkpoints?	03
(b) Write a short note on caspases.	04
(c) Evaluate the importance of receptor-mediated signaling in maintaining cellular communication.	07

- Q.5 (a)** Define apoptosis and mention its importance. **03**
- (b)** What are DNA damage checkpoints? Discuss briefly **04**
- (c)** Elaborate on the role of stem cells in cell renewal and tissue repair. **07**

OR

- (a)** List the phases of the eukaryotic cell cycle. **03**
- (b)** Differentiate between tight junctions and gap junctions. **04**
- (c)** Explain how growth factors and reprogramming influence cell renewal processes. **07**
