

Question Paper

Exam Date & Time: 07-Jul-2023 (02:00 PM - 05:00 PM)



MANIPAL ACADEMY OF HIGHER EDUCATION

FIRST SEMESTER M. Sc. (MEDICAL BIOTECHNOLOGY / MOLECULAR BIOLOGY AND HUMAN GENETICS / GENOME ENGINEERING / TISSUE ENGINEERING) DEGREE EXAMINATION - JULY 2023
SUBJECT: MBT 501 / MBH 501 / MGE 501 / MTE 501 - CELL BIOLOGY
(OBE - 2021 REGULATION)

Marks: 70

Duration: 180 mins.

Answer all the questions.

Illustrate where necessary

- 1) Explain a process of protein sorting in eukaryotic cells. Add a note on glycosylation of proteins. (14)
- 2) What is SCF? Explain the derivation of the acronym by highlighting its functional significance (14)

3) Explain the following:

- 3A) 3D bioprinters in tissue engineering (7)
- 3B) Enzyme linked receptors and their functional relevance in human diseases. (7)

4) Explain the following briefly:

- 4A) Inhibitory phosphorylation and its significance in cell biology. (7)
- 4B) How did the technique FLIP help the biologists to understand the biomembrane transitions? (7)

Answer all the questions.

5) Write short notes on the following:

- 5A) Protein half-life and significance in regulating cellular signalling (3.5)
- 5B) Tyrosine kinase receptors as therapeutic targets (3.5)
- 5C) Lipid rafts (3.5)
- 5D) Negative feedback regulation (3.5)

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FIRST SEMESTER M.Sc. (MEDICAL BIOTECHNOLOGY / MOLECULAR BIOLOGY AND HUMAN GENETICS / SYSTEMS BIOLOGY / GENOME ENGINEERING / TISSUE ENGINEERING) DEGREE EXAMINATION - JULY 2023
SUBJECT: MBT 503/MBH 503/MSB 501/MGE 503/MTE 503 - BIOMOLECULES
(OBE - 2021 REGULATION)

Marks: 70

Duration: 180 mins.

Answer all the questions.

Essays:

- 1) Explain TCA cycle. Describe its amphibolic nature and calculate the energetics. (14)
- 2) Describe beta-oxidation process in detail. Explain fatty acid synthase complex. (14)

3) Short essays:

- 3A) Explain the metabolism of Glycine. Write a note on important products formed from it. (7)
- 3B) Explain the factors which regulate the normal serum calcium level. (7)
- 4A) Describe the structure of heme. What is porphyria? Explain its characteristic features and symptoms. (7)
- 4B) What are the functions of Vitamin A? Explain Wald's visual cycle. (7)

5) Short notes:

- 5A) Uncouplers of electron transport chain. (3.5)
- 5B) Dietary fibers (3.5)
- 5C) Anion gap (3.5)
- 5D) Bence-Jones proteins (3.5)

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