

Question Paper

Exam Date & Time: 14-Aug-2023 (02:00 PM - 05:00 PM)



MANIPAL ACADEMY OF HIGHER EDUCATION

SECOND SEMESTER M. Sc. (MEDICAL BIOTECHNOLOGY/TISSUE ENGINEERING/GENOME ENGINEERING) DEGREE
EXAMINATION - AUGUST 2023
SUBJECT: MBT/MTE/MGE 502 - IMMUNOLOGY AND IMMUNOGENETICS
(OBE - 2021 REGULATION - REPEATERS)

Marks: 70

Duration: 180 mins.

Answer all the questions.

Illustrate where necessary.

Answer the following questions in an essay format.

- 1) Describe T cell mediated antigen recognition along with generation and diversity of T cell receptors. (14)
- 2) Describe classification and functions of pattern recognition receptors in identifying pathogens. Write a note of TLR signalling. (14)

Answer the following questions in the form of a brief essay.

- 3A) Describe evolution of immune system with examples. (7)
- 3B) Explain pleiotropic nature of cytokines with an example. (7)
- 4A) Explain mechanisms regulating T cell dependent B cell activation. (7)
- 4B) What autoimmunity? Explore how autoimmunity and illnesses are caused. (7)

5. Answer the following with a brief note.

- 5A) Anaphylaxis (3.5)
- 5B) Mast cells (3.5)
- 5C) HLA polymorphism. (3.5)
- 5D) Biological function of anti-idiotypic antibodies. (3.5)

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Question Paper

Exam Date & Time: 11-Aug-2023 (02:00 PM - 05:00 PM)



MANIPAL ACADEMY OF HIGHER EDUCATION

SECOND SEMESTER M.Sc. (MEDICAL BIOTECHNOLOGY/MOLECULAR BIOLOGY AND HUMAN GENETICS) DEGREE
EXAMINATION - AUGUST 2023
SUBJECT: MBT 506/MBH 506 - MOLECULAR BIOLOGY II
(OBE - 2021 REGULATION - REPEATERS)

Marks: 70

Duration: 180 mins.

Answer all the questions.

Illustrate where necessary.

- 1) Describe in detail the transposition mechanism in corn. Add a note on the importance of transposons. (14)
- 2) Describe the physical organization and characteristics of eukaryotic genome. (14)

Explain the following briefly:

- 3A) Methods to study proteins. (7)
- 3B) Sporulation in Bacillus. (7)
- 4A) Different types of prokaryotic polymerases and their function. (7)
- 4B) Mating-type switching in yeast. (7)

5. Write short notes on the following:

- 5A) Hallmarks of cancer. (3.5)
- 5B) Gleevec (3.5)
- 5C) DNA microarrays. (3.5)
- 5D) Ribozymes (3.5)

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Question Paper

Exam Date & Time: 16-Aug-2023 (02:00 PM - 05:00 PM)



MANIPAL ACADEMY OF HIGHER EDUCATION

SECOND SEMESTER M. Sc. MEDICAL BIOTECHNOLOGY DEGREE EXAMINATION - AUGUST 2023
SUBJECT: MBT 508 - INDUSTRIAL BIOTECHNOLOGY
(OBE - 2021 REGULATION - REPEATERS)

Marks: 70

Duration: 180 mins.

Answer all the questions.

Illustrate where necessary.

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| 1) | Explain in detail the clarification, concentration and separation techniques. | (14) |
| 2) | Explain the regulation of enzyme activity. Write a note on multienzyme complex with suitable example. | (14) |
| 3A) | Outline the general steps of downstream processing. | (7) |
| 3B) | Explain in brief different components of aeration and agitation in fermentation. | (7) |
| 4A) | Diagnostic significance of AST. | (7) |
| 4B) | What is a Biosensor. Explain the pH meter with neat labelled diagram. | (7) |
| 5A) | Explain in brief the production of Vitamin B12. | (3.5) |
| 5B) | Suicide inhibition. | (3.5) |
| 5C) | Highlight some advantages of Industrial biotechnology. | (3.5) |
| 5D) | Write Michaelis-Menten equation. Give the significance of K_m with an example. | (3.5) |

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