

MANIPAL ACADEMY OF HIGHER EDUCATION
MD (BIOCHEMISTRY) DEGREE EXAMINATION – DECEMBER 2023

PAPER I

Monday, December 04, 2023

Time: 14:00 – 17:00 Hrs.

Max. Marks: 100

✍ **Answer ALL the questions.**

✍ **Long Essay:**

1. Explain the principle and types of electrophoresis. Add a note on immunofixation electrophoresis.

(15 marks)

2. Describe the structure function relationship of proteins with suitable examples. Discuss the disorders associated with abnormal protein structure.

(15 marks)

3. **Write short notes on:**

3A. PCR

3B. Nucleotide analogues

3C. Glycosaminoglycans

3D. Ion selective electrodes

3E. HPLC

3F. Scales of measurement of different types of data

3G. Problem based learning in biochemistry

3H. Cell cycle

3I. Amphipathic lipids and their clinical applications

3J. Radioisotopes

(7 marks × 10 = 70 marks)



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MANIPAL ACADEMY OF HIGHER EDUCATION
MD (BIOCHEMISTRY) DEGREE EXAMINATION – DECEMBER 2023

PAPER II

Tuesday, December 05, 2023

Time: 14:00 – 17:00 Hrs.

Max. Marks: 100

✍ Answer ALL the questions.

✍ Long answer questions:

1. Discuss the metabolism and inborn errors of aromatic aminoacids. (15 marks)

2. Discuss the pathways of metabolism in well fed state and starvation. (15 marks)

3. Write briefly on:

3A. Reactions and significance of uronic acid and polyol pathway.

3B. Lipotropic factors

3C. Balanced diet.

3D. Mechanism of action of antioxidants

3E. Polyamines

3F. Obesity

3G. Hyperuricemia

3H. Functions, deficiency manifestations and clinical use of Vitamin A

3I. Metabolism of HDL & LDL

3J. Pyruvate dehydrogenase complex and significance of LP ratio

(7 marks × 10 = 70 marks)



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MANIPAL ACADEMY OF HIGHER EDUCATION
MD (BIOCHEMISTRY) DEGREE EXAMINATION – DECEMBER 2023

PAPER III

Wednesday, December 06, 2023

Time: 14:00 – 17:00 Hrs.

Max. Marks: 100

✍ **Answer ALL the questions.**

✍ **Long Answer Questions.**

1. Explain – mismatch repair, base excision repair, nucleotide excision repair and double strand break repair and their significance with suitable illustrations.

(15 marks)

2. Explain the regulation of gene expression in prokaryotes and eukaryotes.

(15 marks)

3. **Short Answer Questions:**

3A. Explain the characteristics of the genetic code.

3B. Explain the types of mutations with suitable examples

3C. Explain the inhibitors of translation and transcription

3D. Explain the principles and types of gene therapy

3E. Explain principles and applications of microarrays

3F. Ethical and legal issues related to medical genetics

3G. Explain role of oncogenes and tumour suppressor genes with 2 examples each

3H. Explain hypersensitivity reactions

3I. Explain the immunochemical techniques

3J. Transgenic animals

(7 marks × 10 = 70 marks)



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MANIPAL ACADEMY OF HIGHER EDUCATION
MD (BIOCHEMISTRY) DEGREE EXAMINATION – DECEMBER 2023

PAPER IV

Thursday, December 07, 2023

Time: 14:00 – 17:00 Hrs.

Max. Marks: 100

✍ **Answer ALL the questions.**

✍ **Long Answer Questions.**

1. Discuss the classification and general mechanism of action of hormones.

(15 marks)

2. Discuss the regulation of acid-base balance and associated disorders.

(15 marks)

3. **Short Answer Questions:**

3A. Discuss the various causes of hemolytic anemia.

3B. How do you biochemically evaluate a case of multiple myeloma?

3C. Describe cardiac biomarkers.

3D. Discuss therapeutic drug monitoring.

3E. Discuss the common preanalytical errors in a clinical laboratory.

3F. Discuss the common newborn screening tests in India.

3G. Discuss liver function tests.

3H. Discuss the advantages of laboratory information system.

3I. Describe the advantages and disadvantages of point of care testing.

3J. Discuss the biochemical markers of maternal and fetal health

(7 marks × 10 = 70 marks)

