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MANIPAL ACADEMY OF HIGHER EDUCATION
MD (BIOCHEMISTRY) DEGREE EXAMINATION – JANUARY 2025
(REGULAR)
PAPER I

Tuesday, January 14, 2025

Time: 14:00 – 17:00 Hrs.

Max. Marks: 100

 **Answer ALL the questions.**

1. Explain the structure-function relationship of hemoglobin.
2. Classify phospholipids and explain their importance.
3. Explain the use of synthetic analogues of nitrogenous bases and nucleotides as therapeutic agents.
4. Explain the mechanisms involved in intracellular trafficking and sorting of proteins.
5. Describe the biochemical mechanisms of apoptosis and explain its significance.
6. Discuss the role of second messengers in cellular signalling pathways.
7. Explain the principle, instrumentation and applications of atomic absorption spectrometry.
8. Discuss the process of diagnostic test method validation in clinical biochemistry.
9. Explain the biochemical mechanisms through which environmental pollutants affect human health.
10. Discuss the principles and methods of assessment in medical education.

(10 marks × 10 = 100 marks)



MANIPAL ACADEMY OF HIGHER EDUCATION
MD (BIOCHEMISTRY) DEGREE EXAMINATION – JANUARY 2025
(REGULAR)
PAPER II

Wednesday, January 15, 2025

Time: 14:00 – 17:00 Hrs.

Max. Marks: 100

✍ Answer ALL the questions.

1. Describe various types of enzyme inhibition. Give the mechanism of action of two drugs that act as irreversible inhibitors with their significance.
2. Explain the metabolic adaptations in the liver and adipose tissue under well fed conditions.
3. Explain the biochemical role and deficiency disease of iron. Add a note on the tests used for evaluation of iron deficiency.
4. Discuss the generation of free radicals and role of antioxidants in neutralizing free radicals.
5. Prescribe a weekly diet chart for an adult male weighing 70 kgs on a mixed diet.
6. Explain the formation of active vitamin D and its role in calcium homeostasis.
7. Explain the reciprocal regulation of glycolysis and gluconeogenesis.
8. Describe the complexes and functioning of the respiratory chain. Add a note on oxidative phosphorylation.
9. Discuss the composition and metabolic role of high-density lipoproteins.
10. Discuss heme synthesis and its regulation.

(10 marks × 10 = 100 marks)



MANIPAL ACADEMY OF HIGHER EDUCATION
MD (BIOCHEMISTRY) DEGREE EXAMINATION – JANUARY 2025
(REGULAR)
PAPER III

Thursday, January 16, 2025

Time: 14:00 – 17:00 Hrs.

Max. Marks: 100

✍ Answer ALL the questions.

✍ Draw diagrams wherever necessary

1. Explain replication of eukaryotic DNA. Add a note on inhibitors and significance of telomerases.
2. Explain post transcriptional modifications. Add a note on RNA editing and stability.
3. Describe DNA repair mechanisms and their clinical significance.
4. Explain the process of protein biosynthesis
5. Explain the regulation of gene expression in eukaryotes
6. Describe the recombinant DNA technology
7. Discuss the:
 - a) Mechanism of activation of oncogenes
 - b) Role of tumour markers in clinical practice
8. Discuss the importance of antibodies in diagnosis and treatment
9. Describe genetic polymorphism and its implications with suitable examples
10. Describe the antigen processing and presentation. Explain the role of MHC in the same

(10 marks × 10 = 100 marks)



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MANIPAL ACADEMY OF HIGHER EDUCATION
MD (BIOCHEMISTRY) DEGREE EXAMINATION – JANUARY 2025
(REGULAR)
PAPER IV

Friday, January 17, 2025

Time: 14:00 – 17:00 Hrs.

Max. Marks: 100

Answer ALL the questions.

1. Explain the causes and diagnostic tests for nutritional anemia
2. Write a note on the biochemical evaluation of bone health.
3. Explain the common preanalytical errors in a clinical laboratory
4. Discuss the liver function tests used in the diagnosis of jaundice
5. Classify tumor markers. Add a detailed note on **TWO** commonly used tumor markers
6. Explain the biosynthesis, secretion, regulation, transport and mode of action of thyroid hormones
7. Discuss the biochemical markers of maternal and fetal health
8. Describe the advantages and disadvantages of point of care testing
9. Explain the importance of renal function test
10. Describe the importance of automation in clinical laboratory

(10 marks × 10 = 100 marks) _____

