

## MANIPAL UNIVERSITY

M.Sc. MEDICAL (FINAL) BIOCHEMISTRY DEGREE EXAMINATION – FEBRUARY 2016

### PAPER I: GENERAL BIOCHEMISTRY AND INSTRUMENTATION

Monday, February 01, 2016

Time: 14:00 – 17:00 Hrs.

Maximum Marks: 100

✍ **Answer ALL the questions.**

✍ **Long Essay:**

1. Discuss the principle, procedure and applications of agarose gel electrophoresis. Add a note on factors affecting the electrophoretic mobility.

(15 marks)

2A. What is  $K_m$  value of an enzyme? How it is determined?

2B. Name the types of enzyme inhibition with their importance.

(8+7 = 15 marks)

3. **Write short notes on:**

3A. Principle, procedure and application of TLC.

(7 marks)

3B. Explain with a diagram the parts and their function of a double beam spectrophotometer. What are its applications?

(7 marks)

3C. What are radioactive isotopes? What are their application in Biochemistry?

(7 marks)

3D. Name the different compound lipids with their functions. Name any two inherited disorders of compound lipids and the biochemical defect.

(7 marks)

3E. i) Recombinant DNA technique

ii) PCR technique

(4+3 = 7 marks)

3F. i) Immunodiffusion and its applications

ii) Monoclonal antibodies and their use

(3+4 = 7 marks)

3G. Components of electron transport chain and oxidative phosphorylation.

(7 marks)

3H. i) Multienzyme complexes and their importance

ii) Northern blotting technique and its use

(4+3 = 7 marks)

3I. Membrane structure and membrane transport systems.

(7 marks)

3J. Classification of polysaccharides with composition and functions.

(7 marks)



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### M.Sc. MEDICAL (FINAL) BIOCHEMISTRY DEGREE EXAMINATION – FEBRUARY 2016 PAPER II: METABOLISM AND NUTRITION

Tuesday, February 02, 2016

Time: 14:00 – 17:00 Hrs.

Maximum Marks: 100

- ✍ **Answer ALL the questions.**
- ✍ **Write answers that are brief, clear, relevant and legible.**
- ✍ **Illustrate your answers with neatly drawn and correctly labeled diagrams wherever appropriate.**

✍ **Long Essay:**

- 1A. Mention various types of oxidation of fatty acids in our body and their significance. Explain  $\beta$ -oxidation in detail. (2+2+7 = 11 marks)
- 1B. Discuss the energetics and regulation of fatty acid oxidation. (2+2 = 4 marks)
2. Discuss in detail the catabolism of tryptophan, special compounds synthesized and associated disorders. (8+5+2 = 15 marks)
3. **Write short notes on:**
- 3A. Describe digestion and absorption of dietary carbohydrates. Add a note on lactose intolerance. (5+2 = 7 marks)
- 3B. Biosynthesis of inosine monophosphate (7 marks)
- 3C. Metabolism of calcium (7 marks)
- 3D. Give an account of:  
     i) BMR                      ii) Biological value of proteins (7 marks)
- 3E. Chemistry, sources, RDA, functions and deficiency manifestation of vitamin B<sub>12</sub> (7 marks)
- 3F. Antioxidants and their importance in our body (7 marks)
- 3G. Lipoproteins and their role in lipid metabolism (7 marks)
- 3H. Hormonal regulation of blood glucose (7 marks)
- 3I. Biochemical functions and deficiency manifestations of vitamin A (7 marks)
- 3J. Gout and Lesch-Nyhan syndrome (4+3 = 7 marks)



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**M.Sc. MEDICAL (FINAL) BIOCHEMISTRY DEGREE EXAMINATION – FEBRUARY 2016**  
**PAPER III: MOLECULAR BIOLOGY, BIOTECHNOLOGY AND CLINICAL BIOCHEMISTRY**

Wednesday, February 03, 2016

Time: 14:00 – 17:00 Hrs.

Maximum Marks: 100

✍ **Answer ALL the questions.**

✍ **Long Essay:**

1. Describe the synthesis of thyroid hormones. Explain the various thyroid disorders.  
(8+7 = 15 marks)

2. Describe the regulation of gene expression in eukaryotes.  
(15 marks)

3. **Write short notes on:**

3A. Disorders of bilirubin metabolism

3B. Gene therapy

3C. Tumor markers

3D. Detoxification of xenobiotics

3E. Caspases

3F. Metabolic pathways in RBC and their significance

3G. Porphyrrias

3H. Lac operon and its regulation

3I. Apoptosis

3J. Pheochromocytoma

(7 marks × 10 = 70 marks)

