

MANIPAL ACADEMY OF HIGHER EDUCATION

(Deemed University)

M.Sc. (FINAL) BIOCHEMISTRY DEGREE EXAMINATION – JULY 2003

PAPER I: CHEMICAL NATURE AND METHODS OF STUDY OF BIOCHEMICAL COMPOUNDS AND ENZYMES

Tuesday, July 01, 2003

Time available: 3 Hours

Maximum Marks: 100

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- Answer ANY FIVE Questions.
 - All questions carry equal Marks.
 - Write answers that are brief, clear, relevant and legible.
 - Illustrate your answers with neatly drawn and correctly labelled diagrams wherever appropriate.
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1. Explain in detail the principle of the following methods with one example for each.
 - 1A. Gel filtration chromatography
 - 1B. Paper chromatography
2. Describe the principle and applications of absorbance spectrophotometry. How do you quantitate samples using standard plot and using extinction coefficient?
3. Describe in detail the different levels of protein structure.
4. Describe the isomerism in monosaccharides.
5. Describe the principles and applications of
 - 5A. PCR
 - 5B. RFLP
6. Describe the following:
 - 6A. Helper T cells
 - 6B. B-cells
 - 6C. ELISA
 - 6D. Covalent modifications of enzymes.



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M.Sc. (FINAL) BIOCHEMISTRY DEGREE EXAMINATION – JULY 2003

PAPER II: INTERMEDIARY METABOLISM
Wednesday, July 02, 2003

Time available: 3 Hours

Maximum Marks: 100

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- Answer ANY FIVE Questions.
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 - Write answers that are brief, clear, relevant and legible.
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1. How is glycogen synthesized and degraded in the body? Give an account of the regulation of glycogen metabolism and add a note on the storage disorders associated with it.
2. Describe the metabolism of the various lipoproteins in the body. Add a note on hyperlipoproteinemias.
3. Give an account of the metabolism of glycine. Describe the disorders associated with the above.
4. Give an account of:
 - 4A. Purine catabolism
 - 4B. Post-transcriptional modifications
 - 4C. Significance of HMP shunt pathway
 - 4D. Polyamines
5. Describe in detail the regulation of gene expression. Illustrate with suitable examples.
6. Describe the synthesis and breakdown of pyrimidine nucleotides in the body. Give an account of the disorders associated with it.



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M.Sc. (FINAL) BIOCHEMISTRY DEGREE EXAMINATION – JULY 2003

PAPER III: CLINICAL BIOCHEMISTRY NUTRITION

Thursday, July 3, 2003

Time available: 3 Hours

Maximum Marks: 100

- Answer any FIVE Questions.
 - All questions carry equal Marks.
 - Write answers that are brief, clear, relevant and legible.
 - Illustrate your answers with neatly drawn and correctly labelled diagrams wherever appropriate.
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1. Describe the biochemical importance of folic acid and vitamin B₁₂.
2. Discuss trace element metabolism.
3. What are the various biochemical alterations in the different types of jaundice?
4. Discuss the various aspects of quality control in a laboratory.
5. Write briefly on:
 - 5A. Oncogenes
 - 5B. Serum albumin
6. Describe the synthesis of adrenaline. Describe signal transduction by adrenaline.

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M. Sc. (FINAL) BIOCHEMISTRY DEGREE EXAMINATION – DECEMBER 2003

PAPER I: CHEMICAL NATURE AND METHODS OF STUDY OF BIOCHEMICAL COMPOUNDS AND ENZYMES

Monday, December 01, 2003

Time available: 3 Hours

Maximum Marks: 100

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- Answer ANY FIVE Questions.
 - All questions carry equal Marks.
 - Write answers that are brief, clear, relevant and legible.
 - Illustrate your answers with neatly drawn and correctly labelled diagrams wherever appropriate.
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1. Describe the techniques used for determination of primary structure of proteins. Add a note on the structure activity relationship in the case of hemoglobin.
2. Describe the mechanism of enzyme action with suitable illustrations. Explain competitive inhibition.
3. Write short notes on:
 - 3A. Radioimmunoassay and its applications
 - 3B. Lipoproteins.
4. Give an account of the structure of biological membranes. Explain the mechanisms of transport of molecules across membranes.
5. Write briefly on:
 - 5A. Affinity chromatography
 - 5B. Recombinant DNA
 - 5C. Methods of assessing purity of enzyme
 - 5D. High energy compounds.
6. Write briefly on the chemical structure of starch and glycogen. Discuss the various methods employed for elucidation of their structure.



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M. Sc. (FINAL) BIOCHEMISTRY DEGREE EXAMINATION – DECEMBER 2003

PAPER II: INTERMEDIARY METABOLISM

Tuesday, December 02, 2003

Time available: 3 Hours

Maximum Marks: 100

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- Answer ANY FIVE Questions.
 - All questions carry equal Marks.
 - Write answers that are brief, clear, relevant and legible.
 - Illustrate your answers with neatly drawn and correctly labelled diagrams wherever appropriate.
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1. Describe the metabolism of methionine and cysteine including disorders and substances derived from them.
2. How are the pyrimidine nucleotides synthesized de novo? Highlight the differences from de novo purine synthesis. Add a note on orotic aciduria.
3. Describe the process of transcription in eukaryotes. Add a note on inhibitors of eukaryotic transcription and post-transcriptional modifications.
4. How is lecithin synthesised in the body? What are its various functions in the body?
5. Explain the metabolic changes that occur when one passes from the well-fed state to starvation.
6. Write brief notes on:
 - 6A. Okazaki fragments
 - 6B. Detoxication reactions.

M. Sc. (FINAL) BIOCHEMISTRY DEGREE EXAMINATION – DECEMBER 2003

PAPER III: CLINICAL BIOCHEMISTRY NUTRITION

Wednesday, December 03, 2003

Time available: 3 Hours

Maximum Marks: 100

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- Answer any **FIVE** Questions.
 - All questions carry equal Marks.
 - Write answers that are brief, clear, relevant and legible.
 - Illustrate your answers with neatly drawn and correctly labelled diagrams wherever appropriate.
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1. Write short answers:
 - 1A. Sources of Vitamin D
 - 1B. Biochemical reactions of pyridoxal phosphate
 - 1C. Functions of Vitamin A.

2. Write briefly:
 - 2A. Membrane transport systems
 - 2B. Energy requirements.

3. Classify jaundice and give the laboratory findings in each case.

4. Give short answers:
 - 4A. G-Proteins
 - 4B. Hypothyroidism
 - 4C. Inositol trisphosphate
 - 4D. Biosynthesis of adrenalin.

5. Describe the kidney function tests and their significance.

6. Short notes on:
 - 6A. Acute phase proteins
 - 6B. Quality control in laboratory
 - 6C. Diagnostic enzymes in serum
 - 6D. Antioxidants.

