

## M.Sc. (FINAL) BIOCHEMISTRY DEGREE EXAMINATION – JULY 2005

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

Monday, July 04, 2005

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.**

1. Describe the technique and for determination of primary structure of proteins. Add a note on the structure.
  
- 2A. With aid of appropriate diagram, explain the meaning of the term active site of enzyme.
- 2B. Compare competitive and noncompetitive inhibition of enzymes. Give appropriate examples. Explain the meaning of the term suicide inhibition.
  
3. Write short notes on:
  - 3A. Ion selective electrode.
  - 3B. Chemistry of lipoproteins.
  - 3C. Prostaglandins.
  - 3D. Gas Liquid Chromatography.
  
4. Describe a typical mammalian cell. Describe the experimental method for separating these components. How the purity of the fractions assessed?
  
5. Write short notes on:
  - 5A. Biologically important free nucleotides.
  - 5B. High performance liquid chromatography.
  
6. Write briefly on:
  - 6A. Ultrafiltration
  - 6B. Isotopes
  - 6C. PAGE
  - 6D. Redox potentials



**M.Sc. (FINAL) BIOCHEMISTRY DEGREE EXAMINATION – JULY 2005**

**PAPER II: INTERMEDIARY METABOLISM**

Tuesday, July 05, 2005

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.**

1. How is AMP synthesized? Write down the steps in detail.
  
2. Write short notes on:
  - 2A. Ketosis.
  - 2B. Cori's cycle.
  - 2C. Antimetabolites.
  - 2D. Okazaki fragments.
  
3. Describe the process of translation. Add a note on protein targeting.
  
4. Discuss the role of liver in lipid metabolism.
  
- 5A. Discuss the fate of glucose 6-phosphate in the body.
- 5B. Name the enzyme defect in the metabolism and substances accumulated in the following diseases:
  - i) Methyl malonyl aciduria
  - ii) Homocystinuria
  - iii) Galactosemia
  - iv) Hurler's disease
  - v) Phenylketonuria
  - vi) Von Gierke's disease
  - vii) Orotic aciduria
  - viii) Lesch-Nyhan syndrome
  - ix) Maple syrup urine disease
  - x) Tay Sach's disease
  
- 6A. Explain the process of transamination. Add a note on trans-dehydrogenase reaction.
- 6B. Explain operon concept.



# MANIPAL ACADEMY OF HIGHER EDUCATION

(Deemed University)

## M.Sc. (FINAL) BIOCHEMISTRY DEGREE EXAMINATION – JULY 2005

### PAPER III: CLINICAL BIOCHEMISTRY NUTRITION

Wednesday, July 06, 2005

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.**

1. What is jaundice? Discuss the various biochemical tests done to differentiate the types of jaundice?
  
2. Write short notes on:
  - 2A. Renal rickets
  - 2B. Cyanocobalamin
  - 2C. Bronze diabetes
  - 2D. Protein energy malnutrition
  
3. Write an essay on enzyme profiles of cardiac and liver diseases.
  
4. What is diabetes mellitus? How do you classify it? What are the biochemical alterations in metabolism in diabetes? Add a note on ketoacidosis.
  
5. Write short notes on:
  - 5A. Folic acid.
  - 5B. Alpha tocopherol.
  
- 6A. What is proteinuria? Describe biochemical tests in a case of nephritic syndrome.
- 6B. Give an account of membrane transport systems.

# MANIPAL ACADEMY OF HIGHER EDUCATION

(Deemed University)

**M.Sc. (FINAL) BIOCHEMISTRY DEGREE EXAMINATION – DECEMBER 2005**

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

Monday, December 05, 2005

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.**

1. Describe DNA structure.
2. Derive Michalis-Menten equation. Add a note on the significance of  $K_m$  value.
3. Describe the various “blotting techniques”.
4. Explain the fluid mosaic model structure of the cell membrane. How the lipid composition affects its property? Name the functions of membrane proteins.
5. How to determine the primary structure of a protein?
6. Write short notes on:
  - 6A. Gel filtration.
  - 6B. Microsomes.
  - 6C. Mutarotation.
  - 6D. Chemiosmotic theory.

## M.Sc. (FINAL) BIOCHEMISTRY DEGREE EXAMINATION – DECEMBER 2005

### PAPER II: INTERMEDIARY METABOLISM

Tuesday, December 06, 2005

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.

1. Describe the *de novo* synthesis of fatty acids. How it is regulated?
  
2. Write briefly on:
  - 2A. Inhibitors of replication.
  - 2B. Post-translational modifications.
  - 2C. Caspases.
  - 2D. Telomerase.
  
3. Describe the metabolism of purines. Briefly describe the inherited disorders of purine metabolism.
  
4. Describe the regulation of gene expression.
  
5. What are the specialized products synthesized from cholesterol? Briefly describe their synthesis.
  - 6A. Discuss the role of HMP shunt in metabolism.
  - 6B. Describe the principles of gene therapy.



# MANIPAL ACADEMY OF HIGHER EDUCATION

(Deemed University)

M.Sc. (FINAL) BIOCHEMISTRY DEGREE EXAMINATION – DECEMBER 2005

PAPER III: CLINICAL BIOCHEMISTRY AND NUTRITION

Wednesday, December 07, 2005

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.**

1. Write the distribution, sources, RDA, absorption, transport, excretion, functions, and disorders of CALCIUM metabolism.
2. Explain laboratory tests carried out in the evaluation of renal functions. Interpret them. Add a note on specific gravity of urine.
3. Explain the biochemical basis of nutritional anemia.
4. Write short notes on:
  - 4A. Reference standards in clinical laboratory.
  - 4B. Blood gas analysis and its importance.
- 5A. Explain the use of determination of PSA (Prostatic Specific Antigen) and AFP (Alpha Feto Protein) in serum. Comment on the limitations of this estimation.
- 5B. Describe the roles of oncogenes and antioncogenes.
6. Write short notes on:
  - 6A. Basal Metabolic Rate.
  - 6B. Ion channels.
  - 6C. Prostaglandins.
  - 6D. Hormone receptors.

