

M.Sc. (FINAL) BIOCHEMISTRY DEGREE EXAMINATION – JULY 2006

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

Monday, July 03, 2006

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 how do you elucidate the structure of glucose and starch.

2. Write short notes on:
 - 2A. Classification of proteins.
 - 2B. Structure of immunoglobulins.

3. Describe the principle and applications of
 - 3A. Gel filtration.
 - 3B. Coenzymes.

4. Write short notes on:
 - 4A. Prostaglandins.
 - 4B. Gel electrophoresis.

5. What are radio isotopes? How radio activity can be detected and measured? Discuss the use of radio isotopes in biochemical and medical fields.

6. Explain briefly:
 - 6A. Ultracentrifugation techniques.
 - 6B. The composition (in mole fraction units) of one of the strands of a double helical DNA is [A] = 0.30; [G] = 0.24 and [T] = 0.26. What will be [C] for the same strand? What will be the composition of [A], [G], [T] and [C] of the complementary strand?



M.Sc. (FINAL) BIOCHEMISTRY DEGREE EXAMINATION – JULY 2006

PAPER II: INTERMEDIARY METABOLISM

Tuesday, July 04, 2006

Time available: 3 Hours

Maximum Marks: 100

- ✍ Answer **ANY FIVE** Questions.
✍ Write answers that are brief, clear, relevant and legible.
✍ Illustrate your answers with neatly drawn and correctly labelled diagrams wherever appropriate.

1. Write briefly:

- 1A. Post-translational modifications.
1B. Role of t-RNA in protein synthesis.
1C. Signal sequences.

(7+7+6 = 20 marks)

2. Describe the regulation of blood glucose, its variations with normal activities and the significance of various hormones.

(20 marks)

3. Write briefly:

- 3A. Protein digestion
3B. Digestion of starch
3C. Galactosuria
3D. Name five different plasma proteins and one disease in each case where it varies.

(20 marks)

4. Describe the biosynthesis of various pyrimidines.

(20 marks)

5. Describe the biosynthesis of phosphatidyl choline.

(20 marks)

6. Describe the different one carbon units and their metabolism.

(20 marks)



M.Sc. (FINAL) BIOCHEMISTRY DEGREE EXAMINATION – JULY 2006

PAPER III: CLINICAL BIOCHEMISTRY NUTRITION

Wednesday, July 05, 2006

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. Enumerate the effects of hormones on an adipocyte and explain the action of them.

2. Describe the metabolic derangements in liver failure.

3. Short note on:
 - 3A. Monoclonal antibodies in clinical biochemistry.
 - 3B. Reactive oxygen species.

4. Write short notes on:
 - 4A. Chaperones.
 - 4B. G-proteins.
 - 4C. Sodium potassium ATPase.
 - 4D. Alkaline phosphatase.

5. Describe the regulation of blood pH.

6. Write short notes on:
 - 6A. Lecithin cholesterol acyl transferase.
 - 6B. Balanced diet.
 - 6C. Biotin.
 - 6D. Write normal serum levels of the following. Comment on its significance.
 - i) Urea ii) Uric acid iii) Calcium
 - iv) Albumin v) Potassium



MANIPAL ACADEMY OF HIGHER EDUCATION

(Deemed University)

M.Sc. (FINAL) BIOCHEMISTRY DEGREE EXAMINATION – DECEMBER 2006

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

Monday, December 04, 2006

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. Classify carbohydrates with examples.
2. Explain the strategies and methods to purify a lectin that binds to N-acetyl glucosamine from a plant extract.
3. Describe the structure and function relationship in proteins.
4. Describe allosteric regulation with Aspartate transcarbamoylase as example.
- 5A. Give details of the method of DNA sequencing. Sketch the gel pattern that reveals the DNA sequence of 5'–GCCATTGCA–3'.
- 5B. Compare B–DNA and Z–DNA.
- 6A. Polyhistidine is insoluble in water at pH 7.8 but is watersoluble at pH 5.5. Suggest an explanation.
- 6B. Why penicillin kills only growing cells?
- 6C. Explain transport mechanisms across membranes.

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M.Sc. (FINAL) BIOCHEMISTRY DEGREE EXAMINATION – DECEMBER 2006

PAPER II: INTERMEDIARY METABOLISM

Tuesday, December 05, 2006

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 recombinant DNA technology and its applications.
2. Describe the metabolism of plasma lipoproteins. Add a note on hypercholesterolemia.
3. Describe oxidative phosphorylation via the electron transport chain.
4. Describe the metabolism of the sulfur containing amino acids.
5. Write briefly on:
 - 5A. Post-transcriptional modifications.
 - 5B. Galactosemia.
 - 5C. Nitric oxide.
 - 5D. Significance of HMP shunt pathway.
6. Describe eicosanoid metabolism.

M.Sc. (FINAL) BIOCHEMISTRY DEGREE EXAMINATION – DECEMBER 2006

PAPER III: CLINICAL BIOCHEMISTRY AND NUTRITION

Wednesday, December 06, 2006

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 are porphyrias? Discuss the biochemical lesions associated with hepatic porphyrias. How do you test for porphyrias in urine?

2. Write briefly on:
 - 2A. Orotic aciduria
 - 2B. Biotin
 - 2C. Rhodopsin cycle
 - 2D. Caspases

3. Describe the sources, chemistry, functions and deficiency manifestations of vitamin D.

4. Write short notes on:
 - 4A. Gamma amino butyric acid
 - 4B. Bronze diabetes
 - 4C. Hemoglobin electrophoresis
 - 4D. Preservation of urine for biochemical tests.

5. Describe liver function tests. Give its clinical significance.

6. Write short notes on:
 - 6A. Alpha-1-anti trypsin
 - 6B. Scurvy
 - 6C. G-proteins
 - 6D. Sick cell anemia.

