

MANIPAL UNIVERSITY

FIRST YEAR B.P.T./B.O.T/ B.Sc. M.L.T./ B.Sc. N.M.T./ B.Sc. R.T./ B.Sc. M.I.T.

DEGREE EXAMINATION – AUGUST 2011

SUBJECT: BIOCHEMISTRY

Wednesday, August 24, 2011

Time: 10.00-11.30 Hours

Max. Marks: 40

✗ Answer **ALL** the questions.

✗ Draw diagrams and flow charts wherever appropriate.

1. Write in detail the synthesis of glucose from pyruvate.

(8 marks)

2. Discuss the metabolism of calcium under the following headings:

2A. Factors favouring and hindering absorption.

2B. **SIX** functions.

(3+3 = 6 marks)

3. Answer the following:

3A. With the help of a graph describe the effect of substrate concentration on enzyme activity.

3B. Write the reactions of ketogenesis.

3C. Explain the structure of Watson and Crick model of DNA.

3D. Name the lipoproteins and mention the function of each.

(4×4 = 16 marks)

4. Answer the following:

4A. Mention four differences between kwashiorkor and marasmus.

4B. Write short notes on the principle buffer system of the ECF.

4C. Write four functions of essential fatty acids.

4D. Define transamination reaction. Give one example.

4E. Give the co-enzyme form and the deficiency manifestations of thiamine and niacin.

(2×5 = 10 marks)



MANIPAL UNIVERSITY

FIRST YEAR B.Sc. N.M.T. DEGREE EXAMINATION – AUGUST 2011

SUBJECT: COMPUTERS AND MATHEMATICS

Thursday, August 25, 2011

Time: 10.00-13.00 Hrs.

Max. Marks: 80

✍ Answer SECTION – A and SECTION – B in two separate answer books.

SECTION – A: COMPUTERS: 40 MARKS

1. Answer all the questions.

1A. Write a short note on Normalization.

(5 marks)

1B. What are computers? Explain the same in brief with the help of a diagram.

(5 marks)

1C. What are the differences between Main and Auxillary memory of the computer?

(5 marks)

1D. Calculate the left ventricular ejection fraction (LVEF) using the following parameters:

ROI	No: of Pixels	Total Counts
ED	400	80000
ES	250	45000
Bkg	55	6000

(5 marks)

1E. Write a short note on Software.

(5 marks)

1F. Convert the following:

i) $(1001)_2$

ii) $(236)_{10}$

(2½×2 = 5 marks)

1G. For a gamma camera having 0.96cm as FWHM and 600mm as the FOV, which matrix size would give an optimum resolution?

(5 marks)

1H. Write a short note on Interpolation and Cinematic Display.

(5 marks)

SECTION – B: MATHEMATICS: 40 MARKS

✍ Answer any EIGHT questions of the following:

2A. Write a short note on log – log graph.

2B. If $\sin A = \frac{4}{5}$, $\pi < A < \pi$; Find: $\frac{2 \sin A - 3 \cos A}{4 \sin A + 9 \cos A}$

(2+3 = 5 marks)

3A. Find derivative of : $x^2 - 3x + 2$ with respect to x .

3B. State and prove Lagrange's Mean Value theorem.

(2+3 = 5 marks)

4A. Define power set, null set, union set and complimentary set.

4B. Solve the equation $2x^2 - 13x + 15 = 0$ by using the completing the square method.

(2+3 = 5 marks)

5. Evaluate: $\int \frac{2x+1}{x^2 - 3x + 2} dx$.

(5 marks)

6. 300mCi of I-131 calibrated on 02-03-09 at 12.30pm and 100mCi of the activity used on that time. What is the remaining activity on 15-03-09 at 10 a.m. ($t_{1/2} = 8$ days)

(5 marks)

7A. Solve: $3^3 - 2 \times 3 + 5 - \{8 - 2 \times 3 (10 - 2) + 4\} \div 2$

7B. Prove that: $\frac{1 + \sin \theta - \cos \theta}{1 + \sin \theta + \cos \theta} = \tan \theta/2$

(2+3 = 5 marks)

8A. The radius of a right circular cylinder is 7 cm. If the height of the cylinder is 10 cm, calculate the curved surface area.

8B. Prove that: $\log_4 2 + \log_8 2 + \log_{16} 2 = 13/12$.

(2+3 = 5 marks)

9A. Find $\lim_{x \rightarrow a} \frac{x - a}{\sqrt{x^3} - \sqrt{a^3}}$

9B. Evaluate: $\int (x^2 - 2x + 5)^5 (x - 1) dx$

(2+3 = 5 marks)

10A. Evaluate: $\int_1^2 (x^2 + 1) dx$.

10B. Form differential equation by eliminating the arbitrary constant 'a': $ay^2 = x^3$.

(2+3 = 5 marks)

