

## MANIPAL UNIVERSITY

FIRST YEAR B.Sc. M.L.T./ B.Sc. N.M.T./ B.Sc. R.T./ B.Sc. M.I.T./ B.Sc. C.V.T.  
DEGREE EXAMINATION – MAY/JUNE 2012

SUBJECT: ANATOMY

Tuesday, May 29, 2012

Time: 10.00-11.30 Hrs.

Max. Marks: 40

✍ **Answer ALL the questions.**

1. Name the parts of urinary system. Describe the right kidney.

(2+6 = 8 marks)

2. Name the parts of gastrointestinal tract. Describe the stomach in detail.

(2+6 = 8 marks)

3. **Write briefly on:**

3A. Panaceas

3B. Testis

3C. CSF circulation

3D. Fallopian tube

3E. Structure of a typical synovial joint

3F. Arch of aorta

3G. Trachea

3H. Thin skin

(3×8 = 24 marks)



**MANIPAL UNIVERSITY****FIRST YEAR B.O.T. /B.Sc. M.L.T./B.Sc. C.V.T/ B.Sc. MIT/ B.Sc. R.T./B.Sc. N.M.T/  
B.Sc. OPT. DEGREE EXAMINATION – MAY/JUNE 2012****SUBJECT: PHYSIOLOGY**

Thursday, May 31, 2012

Time: 10.00-11.30 Hours.

Max. Marks: 40

✍ **Answer ALL questions. Draw diagrams wherever necessary.**

**1. Essay questions:**

- 1A. Draw a labeled diagram of the nerve action potential. Mention the ionic basis for the different phases.
- 1B. In the form of a flow chart write the sequence of events occurring during the excitation contraction on coupling of a skeletal muscle.
- 1C. Describe the changes seen in the ovary during menstrual cycle.
- 1D. Explain the various types of movements in the small intestine.

(5×4 = 20 marks)

**2. Write short answers for the following:**

- 2A. What are anticoagulants? Mention any two anticoagulants.
- 2B. Mention any two functions of basal ganglia.
- 2C. Write any two properties of cardiac muscle.
- 2D. Define cardiac output and give the normal value.
- 2E. Define alveolar ventilation and pulmonary ventilation.
- 2F. Name the hormones of posterior pituitary. Mention one action of any one hormone
- 2G. Mention the cause and two features of clinical features of diabetes mellitus.
- 2H. Define GFR and mention the normal value.
- 2I. Draw a diagram to depict a reflex arc.
- 2J. List any two common errors of refraction. Describe any one.

(2×10 = 20 marks)



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DEGREE EXAMINATION – MAY/JUNE 2012**

**SUBJECT: BIOCHEMISTRY**

Saturday, June 02, 2012

Time: 10.00-11.30 Hours

Max. Marks: 40

- ✍ **Answer ALL the questions.**  
✍ **Draw diagrams and flow charts wherever appropriate.**

1. Discuss  $\beta$ -oxidation of palmitic acid under the following headings:

- 1A. Site and sub-cellular site  
1B. Activation and transport  
1C. Reactions

(1+3+4 = 8 marks)

2. Describe the complete digestion of carbohydrates in the GIT.

(6 marks)

3. **Answer the following:**

- 3A. Explain with diagrams the secondary structure of proteins.  
3B. Define isoenzymes and explain the isoenzymes of LDH with its clinical significance.  
3C. Write the reactions of the four key enzymes of gluconeogenesis.  
3D. Discuss the RDA, sources and biochemical functions of vitamin D.

(4×4 = 16 marks)

4. **Answer the following:**

- 4A. Define steatorrhea and give its causes.  
4B. Write a note on the regulation of glycolysis.  
4C. Classify amino acids based on nutritional requirement with ONE example each.  
4D. Define specific dynamic action of food and give values for the major macronutrients.  
4E. Give normal serum levels of glucose in fasting and post-prandial states.

(2×5 = 10 marks)



## MANIPAL UNIVERSITY

**FIRST YEAR B.Sc. N.M.T. DEGREE EXAMINATION – MAY/JUNE 2012**

**SUBJECT: COMPUTERS AND MATHEMATICS**

Tuesday, June 05, 2012

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**

✍ **Answer all the questions.**

- 1A. What is Gamma Camera Interface? List the application of the same in Nuclear Medicine. (5 marks)
- 1B. Write on the classification of computers. (5 marks)
- 1C. Define the following terms:
- i) BYTE
  - ii) Word
  - iii) Pixel
  - iv) Matrix size
- (1¼×4 = 5 marks)
- 1D. Apply a 9 point filter of (4,2,1) weightage on the following image matrix.
- |   |    |   |   |
|---|----|---|---|
| 1 | 2  | 1 | 2 |
| 3 | 10 | 6 | 7 |
| 2 | 2  | 3 | 1 |
- (5 marks)
- 1E. Write a short note on pixel depth. (5 marks)
- 1F. Write a short note on Image Algebra with its applications. (5 marks)
- 1G. **Write on the following:**
- i) Seek time
  - ii) Latency Period
- (2½×2 = 5 marks)
- 1H. Write on BUS. (5 marks)

**SECTION – B: MATHEMATICS: 40 MARKS**

☞ Answer any EIGHT of the following:

2A. Convert degree to radian and radian to degree.

$$60^\circ, 15^\circ, (6\pi/5)^\circ, (5\pi/6)^\circ$$

2B. Prove that  $(\sin \theta + \operatorname{cosec} \theta)^2 + (\cos \theta + \sec \theta)^2 = 7 + \tan^2 \theta + \cot^2 \theta$

(2+3 = 5 marks)

3A. Evaluate :  $\lim_{x \rightarrow \infty} \frac{x^2 + b^2}{x^2 + a^2}$

3B. Prove that :  $\log 81/8 - 2 \log 3/2 + 3 \log 2/3 + \log 3/4 = 0$

(2+3 = 5 marks)

4A. Let  $A = \{2, 4, 5, 6, 8, 9\}$ ,  $B = \{1, 2, 6, 7, 8\}$  Find  $A \cap B$ ,  $A \cup B$  and draw Venn diagram.

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

(2+3 = 5 marks)

5A. The diameter of a cylinder is 28 cm and its height is 20 cm, Find the total surface area.

5B. Verify Lagrange's Mean Value Theorem for the function:

$$f(x) = x^{10} - x^4 + 1 \text{ for } \phi \in (-1, 1)$$

(2+3 = 5 marks)

6A. Define onto function, even function, odd function and one-to-one function.

6B. Evaluate :  $\int (x^2 - 2x + 5)^5 (x - 1) dx$

(2+3 = 5 marks)

7A. Explain log-log graph.

7B. Show that two curves  $2y = 3x + x^2$  and  $2x + 3y - y^3 = 0$  cut orthogonally.

(2+3 = 5 marks)

8A. Solve:  $20 - 3 \times 2 \{16 - (8 \times 2 - 6) \times 2\} \div 2 - 8$

8B. State and prove Roll's theorem

(2+3 = 5 marks)

9. Evaluate:  $\int \frac{3x-2}{(x+1)(x^2+4)} dx$

(5 marks)

10. 200 mCi of Tc- 99m is eluted at 9.00 a.m. 50 mCi of Tc- 99m used for some patients immediately. Find the activity remaining at 2.30 p.m. ( $t_{1/2} = 6$  hrs)

(5 marks)

