

**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 2009****SUBJECT: ANATOMY**

Monday, May 18, 2009

Time: 10.00-11.30 Hrs.

Max. Marks: 40

1. List the parts of female reproductive system. Describe the position, parts, relations and blood supply of the uterus.

(2+1+2+2+1 = 8 marks)

2. Explain the arterial supply and venous drainage of the heart.

(4+4 = 8 marks)

3. Answer briefly on:

3A. Skeletal muscle.

3B. Nasal septum.

3C. Superior vena cava.

3D. Nerve supply of tongue.

3E. Ureter.

3F. Right suprarenal gland.

3G. Cerebrospinal fluid.

3H. Corpus callosum.

(3×8 = 24 marks)



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**FIRST YEAR B.P.T./B.O.T./B.Sc.M.E.T./B.Sc.N.M.T/B.Sc.R.T.T.**  
**DEGREE EXAMINATION – MAY 2009**

**SUBJECT: PHYSIOLOGY**

Tuesday, May 19, 2009

Time: 10.00-13.00 Hours.

Max. Marks: 80

1. Explain the functions of different areas of cerebral cortex. (10 marks)
  
2. Describe mechanism of breathing. (10 marks)
  
3. Write briefly on the following:
  - 3A. Enumerate any four properties of cardiac muscle. Explain briefly any two of them.
  - 3B. Define venous return. Name any four factors influencing venous return. Explain how venous return affects cardiac output.
  - 3C. Draw and label the diagram of the cross section of the human eye. Mention the functions of any two structures.
  - 3D. Explain the actions of thyroid hormones on growth and development.
  - 3E. Mention the function of T-tubules and terminal cisternae of sarcotubular system. What are the sources of energy for muscular contraction?
  - 3F. Describe the structure and functions of the respiratory membrane.
  - 3G. Describe the functions of basal ganglia. Mention the clinical features of a disease due to a lesion in it.
  - 3H. Draw and label the normal electrocardiogram. Write a note on P-R interval. (5×8 = 40 marks)
  
4. Write short answer to each of the following:
  - 4A. Mention two actions of estrogen.
  - 4B. Define deglutition. Mention the stages of deglutition.
  - 4C. What is hemophilia? What is its cause?
  - 4D. How much is the normal body temperature? Name ONE change in the body when exposed to cold.
  - 4E. Mention the effects of sectioning of a motor nerve.
  - 4F. List the functions of placenta.
  - 4G. List the hormones which increase blood glucose level.
  - 4H. Name the lymphatic organs in the body. Mention the function of one of them.
  - 4I. What is meant by oxygen carrying capacity of blood? Give its normal value.
  - 4J. Mention the functions of saliva. (2×10 = 20 marks)



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(NEW REGULATIONS)**

Wednesday, May 20, 2009

Time: 10.00-11.30 Hours

Max. Marks: 40

1. Explain the  $\beta$ -oxidation of palmitic acid. Add note on its energetic. (5+2 = 7 marks)
2. Describe the pathway of urea synthesis. Mention the disorders of urea cycle with defect. (4+2 = 6 marks)
3. Give an account of glycogen metabolism. (3+3 = 6 marks)
4. Discuss protein energy malnutrition in detail. (7 marks)
5. Explain how substrate concentration affects enzyme activity. (4 marks)
6. Write the steps involved in the activation of vitamin D in the body. (3 marks)
7. Write note on Dietary Fibers. (3 marks)
8. Explain Essential fatty acids under the following Definition, examples and functions. ( $\frac{1}{2}+1+2\frac{1}{2} = 4$  marks)



## MANIPAL UNIVERSITY

FIRST YEAR B.Sc. N.M.T. DEGREE EXAMINATION – MAY 2009

SUBJECT: COMPUTERS AND MATHEMATICS

Thursday, May 21, 2009

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.

1. What are Computers? Classify them and give its application in Nuclear Medicine.
2. Define the following terms:
  - 2A. Hardware
  - 2B. Software
  - 2C. Analogue Number
  - 2D. Digital Number
3. Write a short note on Camera Interface.
4. Write a short note on Image Smoothing.
5. Differentiate between list mode and frame mode.
6. What is Cache Memory?
7. Write a Short note on Region of Interest and PACS.
8. Write on digital images.

(5×8 = 40 marks)

SECTION – B: MATHEMATICS: 40 MARKS

✍ Answer any EIGHT questions of the following:

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

9B. Prove that  $\log_4 2 + \log_8 2 + \log_{16} 2 = 13/12$ .

(2+3 = 5 marks)

10A. Show that  $(\tan \theta + \cot \theta)^2 = \sec^2 \theta + \operatorname{cosec}^2 \theta$ .

10B. Prove that  $l$  is the length of an arc of a circle of radius  $r$ , subtending an angle  $\theta^\circ$  at the centre, then  $l = r\theta$ .

(2+3 = 5 marks)

11A. Find the value of:  $\sin \pi/3 \cdot \cos \pi/6 + \cos \pi/3 \cdot \sin \pi/6$ .

11B. Find the value of x and y by solving simultaneous equation:

$$2x - 3y + 7 = 0 \text{ and } 5x + 2y + 8 = 0$$

(2+3 = 5 marks)

12A. Define constant function, onto function, one-one function and even function with one example.

12B. For a given function  $f(x) = 1 - 3x$ , find all  $\phi$  between (1, 4) satisfying the L.M.T.

(2+3 = 5 marks)

13A. Explain log-log graph.

13B. Evaluate:  $\int x \cos^2 x \, dx$ .

(2+3 = 5 marks)

14A. Find the angle of intersection of  $y = x^3$ ;  $6y = 7 - x^2$  at the point (1,1).

14B. Differentiate with respect to x:  $y = \frac{x^2}{3x-2}$ .

(2+3 = 5 marks)

15A. Evaluate:  $\int_1^2 (x^2 + 1) \, dx$ .

15B. Form differential equation by eliminating the arbitrary constant 'a':  $ay^2 = x^3$ .

(2+3 = 5 marks)

16A. Solve quadratic equation by factoring:  $9x^2 - 15xy + 4y^2 = 0$ .

16B. Find the value of  $\frac{4 \sin A + \cos A}{8 \sin A + 2 \cos A}$  when  $\operatorname{cosec} A = -13/12$  and  $180^\circ < A < 270^\circ$ .

(2+3 = 5 marks)

17. 550 mCi of I-131 calibrated on 01-03-08, 12 noon ; 50mCi and 100mCi used for the patients on the same day. Find the remaining activity of I-131 on 12-03-08, at 11 A.M. ( $t_{1/2} = 8$  hrs).

(5 marks)

