Reg. No.										

MANIPAL UNIVERSITY

FIRST YEAR B.Sc. N.M.T./ B.Sc. R.T./ B.Sc. M.I.T./ B.Sc. C.V.T. DEGREE EXAMINATION – AUGUST 2010

SUBJECT: ANATOMY

Monday, August 23, 2010

Time: 10.00-11.30 Hrs. Max. Marks: 40

1. Explain the parts, relations, blood supply and nerve supply of stomach.

(2+3+2+1 = 8 marks)

2. Describe the blood supply of heart.

(8 marks)

3. Answer briefly on:

3A. Intrinsic muscles of larynx

3B. Parts and external features of uterus

3C. Nerve supply of tongue

3D. Functional lobes of cerebellum

3E. Circulation of CSF

3F. Middle mediastinum

3G. Functions of hypothalamus

3H. Relations of left kidney

(3×8 = 24 marks)

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FIRST YEAR B.P.T./B.O.T./B.Sc.N.M.T/B.Sc.R.T. DEGREE EXAMINATION – AUGUST 2010

SUBJECT: PHYSIOLOGY

Tuesday, August 24, 2010

Time: 10:00-13:00 Hours. Max. Marks: 80

✍ **Answer all questions.**

1. Define blood pressure and give the normal values in an adult. Explain the short term regulation of blood pressure.

(10 marks)

2. Classify white blood cells. Give their percentage distribution in an adult. Draw neat labeled diagrams of any two of them and explain their functions.

(10 marks)

3. Write short notes on the following:

3A. Oxygen transport
3B. Diabetes mellitus
3C. Milk ejection reflex
3D. Blood groups
3E. Excitation-Contraction coupling in skeletal muscle
3F. Functions of placenta.
3G. Mechanism of hydrochloric acid secretion in the stomach
3H. Functions of middle ear

(5×8 = 40 marks)

4. Write brief answers to the following questions:

4A. Mention two factors affecting cardiac output.
4B. Name the photoreceptors in the eye. Mention their functions.
4C. Mention any two hormones secreted by the anterior pituitary and mention one action of each.
4D. Mention the functions of platelets.
4E. Define 'erythropoiesis'. Mention two factors regulating it.
4F. Draw a labelled diagram of a nephron.
4G. List four factors increasing heart rate.
4H. Define 'Hypoxia'. Mention any two types of hypoxia.
4I. Enumerate two functions of hypothalamus.
4J. List two differences between upper motor neuron lesion and lower motor neuron lesion.

(2×10 = 20 marks)

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FIRST YEAR B.P.T/ B.O.T/ B.Sc. N.M.T./ B.Sc. R.T./ B.Sc. M.I.T./ B.Sc.C.V.T DEGREE EXAMINATION – AUGUST 2010

SUBJECT: BIOCHEMISTRY
(NEW REGULATIONS)

Wednesday, August 25, 2010

Time: 10.00-11.30 Hours | Max. Marks: 40

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

1. Discuss urea cycle under the following headings:

1A. Site and subcellular site.

1B. Reactions.

1C. Mention **TWO** disorders of urea cycle and their defective/deficient enzyme.

(1+5+2 = 8 marks)

2. Classify enzymes giving **ONE** example for each class.

(6 marks)

3. Write briefly on:

3A. Reactions of ketolysis.

3B. **FOUR** differences between marasmus and kwashiorkor.

3C. Causes and biochemical findings of metabolic acidosis.

3D. Dietary sources and functions of vitamin C.

(4×4 = 16 marks)

4. Explain the following with an example

4A. Essential fatty acids.

4B. Specific dynamic action.

4C. Positive nitrogen balance.

4D. Proenzymes.

4E. Mutual supplementation of proteins.

(2×5 = 10 marks)

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MANIPAL UNIVERSITY

FIRST YEAR B.Sc. N.M.T. DEGREE EXAMINATION – AUGUST 2010

SUBJECT: COMPUTERS AND MATHEMATICS

Thursday, August 26, 2010

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. Write on the input and output devices of the computer.

(5 marks)

2. What is the corrected kidney counts if
   a) the total counts obtained from the left and right kidney ROI is 58650 and 63439 respectively
   b) the number of pixels in the left and right kidney ROI is 1434 and 1532 respectively
   c) the background count for both the ROI is 3934
   d) the number of pixels in the background ROI is 200

(5 marks)

3. Write a short note on Networking of Imaging Computers.

(5 marks)

4. How would you reduce the noise in a curve?

(5 marks)

5. Apply a 9 point filter of (2,1) weightage on the following image matrix.

2	4	3	1
1	5	5	3
2	8	4	1

(5 marks)

6. Define the following terms:

6A. Frame rate

6B. Bit

(2½×2 = 5 marks)

7. Write a short note on Analogue to Digital Converter.

(5 marks)

8. Write a short note on Networking of Imaging computers.

(5 marks)

SECTION – B: MATHEMATICS: 40 MARKS

✍ **Answer any EIGHT of the following:**

9A. The length of an arc of a circle of radius 10 cm is 4 cm. Find the central angle.

9B. Prove that $(\sin\theta + \operatorname{cosec}\theta)^2 + (\cos\theta + \sec\theta)^2 = 7 + \tan^2\theta + \cot^2\theta$.

(2+3 = 5 marks)

10A. Find the value of : sin 420. cos (-300)

10B. $2^x = 3^y = 6^{-z}$, Show that xy + yz + zx = 0

(2+3 = 5 marks)

11A. Define power set, null set, union set and complimentary set.

11B. Solve the equation $2x^2 - 13x + 15 = 0$ by using the completing the square method.

(2+3 = 5 marks)

12A. Evaluate: $\int \sin^2 x \, dx$.

12B. Prove that: $\lim_{\theta \to 0} \frac{\sin\theta}{\theta} = 1$.

(2+3 = 5 marks)

13A. Find the angle of intersection of $y = x^3$; $6y = 7 - x^2$ at the point (1,1).

13B. Differentiate with respect to x: $y = \frac{x^2}{3x-2}$.

(2+3 = 5 marks)

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

(5 marks)

15. 300 mCi of Tc- 99m is eluted at 9.00 a.m. 100 mCi of Tc- 99m used for some patients immediately. Find the activity remaining at 4.30 p.m. ($t_{½}$ = 6 hrs)

(5 marks)

16A. Explain the graph of sin x.

16B. Explain with example of odd function, even function and one-to-one function.

(2+3 = 5 marks)

17A. Solve: $20 - 3\{16 - (8 \times 2 - 6) \times 2\} \div 2 - 8 \times 2$

17B. State and prove Roll's theorem

(2+3 = 5 marks)