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MANIPAL UNIVERSITY

FIRST YEAR B.Sc. M.L.T./B.Sc. R.T./B.Sc. M.R.T./B.Sc. M.I.T./B.Sc. C.V.T./
B.Sc. R.R.T & D.T. DEGREE EXAMINATION – AUGUST 2015

SUBJECT: ANATOMY

Wednesday, August 26, 2015

Time: 10.00 – 11.30 Hrs.

Max. Marks: 40

Answer ALL the questions.

1. Name the components (parts) of female reproductive system. Describe the position, parts, relations, blood supply and lymphatic drainage of uterus.

(2+8 = 10 marks)

2. **Write short notes on:**

2A. Classification and structure of bones

2B. Lungs

2C. Aorta

2D. Anal canal

2E. Pituitary gland

2F. Lobes and functional areas of cerebral hemisphere

(5 marks × 6 = 30 marks)



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FIRST YEAR BOT / B.Sc. MLT / B.Sc. CVT / B.Sc. MIT / B.Sc. RT / B.Sc. NMT /
B.Sc. RRT & DT / B.Sc. MRT / DEGREE EXAMINATION – AUGUST 2015

SUBJECT: PHYSIOLOGY

Thursday, August 27, 2015

Time: 10.00 – 11.30 Hours.

Max. Marks: 40

✍ Answer ALL questions. Draw diagrams and flow chart wherever appropriate.

1. Essay Questions:

- 1A. Explain the intrinsic mechanism of blood clotting.
- 1B. Draw and label a normal electrocardiogram from limb lead II and mention the causes for each wave.
- 1C. Mention any three functions of cerebellum. List any two features of cerebellar lesion.
- 1D. List four actions of thyroid hormones. Name the condition that results due to deficiency of thyroid hormones in adults.

(5 marks × 4 = 20 marks)

2. Short Answer Questions:

- 2A. Describe rigor mortis
- 2B. Describe primary active transport mechanism with an example
- 2C. List two features of erythroblastosis fetalis
- 2D. What are the two different forms of carbon dioxide transport in blood?
- 2E. Define cardiac output. Mention its normal value
- 2F. Name the components of vestibular apparatus
- 2G. List any two functions of liver
- 2H. Mention any two actions of testosterone
- 2I. Define glomerular filtration rate. Give its normal value
- 2J. Mention two properties of sensory receptors

(2 marks × 10 = 20 marks)



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MANIPAL UNIVERSITY
FIRST YEAR B.Sc. M.R.T. DEGREE EXAMINATION – AUGUST 2015

SUBJECT: RADIOBIOLOGY
(2011 SCHEME)

Friday, August 28, 2015

Time: 10:00 – 11:30 Hrs.

Max. Marks: 40

✍ Answer ALL the questions.

1. Answer the following questions:

- 1A. Discuss Compton effect
- 1B. Define and describe $LD_{50(30)}$
- 1C. Write short note on bone marrow syndrome
- 1D. What are the consequences of effect of radiation on water?

(5 marks \times 4 = 20 marks)

2. Answer the following questions:

- 2A. Describe in detail about the types of chromosomal aberrations after irradiation.
- 2B. Define cell survival curve. Draw a typical shouldered *in vitro* mammalian cell survival curve and explain the parameters D_0 , D_q and N .

(10 marks \times 2 = 20 marks)



MANIPAL UNIVERSITY

FIRST YEAR B.Sc. M.R.T. DEGREE EXAMINATION – AUGUST 2015

**SUBJECT: BASIC AND APPLIED MATHEMATICS
(2011 SCHEME)**

Saturday, August 29, 2015

Time: 10:00 – 13:00 Hrs.

Max. Marks: 80

Answer Any FIVE full questions.

1A. Let $A = \{1, 2, 3\}$, $B = \{3, 4\}$ and $C = \{4, 5, 6\}$. Find $A \times (B \cap C)$ and $(A \times B) \cup (B \times C)$.

1B. Find the value of:

i) $\tan^2 60^\circ \cdot \sin^2 90^\circ - \cot^2 30^\circ \cdot \tan^2 45^\circ$

ii) $\sin 30^\circ \cdot \operatorname{Cosec}^2 60^\circ + \tan^2 60^\circ \cdot \operatorname{Cosec} 30^\circ$

1C. Find the volume and total surface area of cylinder having height 1 foot and base diameter of 10 inches.

(4+6+6 = 16 marks)

2A. Evaluate: i) $\int (5 - 7x + \cos x) \cdot dx$ ii) $\int \frac{(6x-5)}{\sqrt{3x^2-5x+7}} dx$

2B. If $y = \cos x$, find $\frac{dy}{dx}$ using first principles.

2C. Solve $(x + y + 1) \frac{dy}{dx} = 1$

(4+6+6 = 16 marks)

3A. Evaluate: i) $\lim_{x \rightarrow b} \left[\frac{x^5 - b^5}{x^4 - b^4} \right]$ ii) $\lim_{x \rightarrow 0} \left[\frac{1 - \cos 2x}{1 - \cos 4x} \right]$

3B. Check whether the following are quadratic equation:

i) $(x - 2)^2 + 1 = 2x - 3$. ii) $x^2 - 2x = (-2)(3 - x)$

3C. Give the domain of the following functions:

i) $f(x) = \frac{2x}{2x+7}$ ii) $f(x) = \frac{x+3}{\sqrt{x^2-5x+4}}$ iii) $f(x) = \frac{1}{\sqrt{x^2-6x+9}}$

(4+6+6 = 16 marks)

4A. There are 79 students in a class. All of these take some combination of Maths, Geography and History. The number who take Geography is 41; those who take History is 36; and 30 take Maths. The number who take Maths and History is 16; the number who take Geography and History is 6, and there are 8 who take Maths only and 16 who take History only.

i) Draw a Venn diagram to illustrate all this information.

ii) How many students take Maths and Geography but not History?

iii) How many students take Geography only?

4B. Integrate: i) $\int \frac{(1-\tan x)}{(1+\tan x)} dx$ ii) $\int x\sqrt{1-x^2} dx$

4C Solve $\frac{d^4y}{dx^4} + 8 \cdot \frac{d^2y}{dx^2} + 16y = 0$

(4+6+6 = 16 marks)

5A. If $A(-5,7), B(-4, -5), C(-1, -6), D(4,5)$ are the vertices of a quadrilateral, find the area of the quadrilateral ABCD.

5B. Solving the system of eqns. $2x - y + 8z = 13; 3x + 4y + 5z = 18; \& 5x - 2y + 7z = 20$.

5C. If $x = r \cdot \cos\alpha \cdot \cos\beta, y = r \cdot \cos\alpha \cdot \sin\beta, z = r \cdot \sin\alpha$, prove that $x^2 + y^2 + z^2 = r^2$

(4+6+6 = 16 marks)

6A. Solve:

i) $(D^2 - 4D + 4)y = 0$

ii) $(D^2 + 3D + 6)y = 0$

6B. Find the graph of $y = \cos x$ using trigonometric values.

6C. Solve $3 \cdot e^x \cdot \tan y \cdot dx + (1 - e^x) \cdot \sec^2 y \cdot dy = 0$

(4+6+6 = 16 marks)



MANIPAL UNIVERSITY

FIRST YEAR B.Sc. M.R.T. DEGREE EXAMINATION – AUGUST 2015 SUBJECT: FUNDAMENTALS OF COMPUTERS AND COMPUTER APPLICATIONS (2011 SCHEME)

Monday, August 31, 2015

Time: 10:00 – 11:30 Hrs.

Max. Marks: 40

✍ Answer Any FOUR full questions. Version of MS Office is 2007.

- 1A. Define computers and what are its capabilities.
1B. Draw a neat block diagram of computer.
1C. Describe paper-white display monitors, electroluminescent monitor and plasma panel monitor.

(4+3+3 = 10 marks)

- 2A. Compare computers based on their working principles.
2B. Explain the four characteristics of a printer.

(5+5 = 10 marks)

3. Write the steps to create a word document in which bullets and numbering is as below:

1. Main Question1.....
 - a. Sub question 1.....
 - i. Option 1
 - ii. Option 2
 - OR
 - b. Sub question2.....
 - i. Option 1
 - ii. Option 2
 - iii. Option 3
5. Main Question 2.....
 - a. Sub question 2.....
 - i. Option 1
 - ii. Option 2
 - c. Sub Question 3...
 - Number 1.....
 - Number 2.....

(10 marks)

4. Consider the following excel sheet:

	A	B	C	D	E
1	Regno	Name	Section	Marks1	MArks2
2	100	Ravi	A	80	89
3	101	Ramesh	B	56	83
4	102	Aravind	A	89	48
5	103	Akanksh	A	78	33
6	104	Naveen	C	90	88
7	105	Nagarj	C	78	35
8	106	Krishna	B	66	78

4A. Write the steps sort (in ascending order) these students records 1st based on Section (primary sorting column 1st level), Marks1 (2nd level sorting column-in ascending order), Marks2 (3rd level sorting column-in descending order).

4B. Write the steps to create border to the cells as shown above in the excel work sheet.

(9+1 = 10 marks)

5. **Answer the following questions.**

5A. What are different components of MS Access database?

5B. Discuss the usage of following HTML tags with syntax and example:

i) `<p>`

ii) `<sub>`

iii) `<sup>`

iv) `<hr>`

v) `<a>`

(5+5 = 10 marks)

