| Reg. No. | | | | | | | | | | |
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# MANIPAL UNIVERSITY

## FIRST YEAR B.Sc. R.T./B.Sc. M.R.T./B.Sc. C.V.T. DEGREE EXAMINATION – JUNE 2017

### SUBJECT: ANATOMY

**(2015 SCHEME/2011 SCHEME/2015 SCHEME**

Thursday, June 15, 2017

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

1. Name the parts of gastrointestinal tract: List the difference between small intestine and large intestine.

(5+5 = 10 marks)

2. **Write short notes on the following:**

2A. Neuron

2B. Larynx

2C. Gall bladder

2D. Uterus

2E. Eyeball

2F. Fourth ventricle

(5 marks × 6 = 30 marks)

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# MANIPAL UNIVERSITY

## FIRST YEAR BOT/B.Sc. MRT/B.Sc. CVT/B.Sc. RT DEGREE EXAMINATION – JUNE 2017

### SUBJECT: PHYSIOLOGY

(2015 SCHEME (BOT 106)/2011 SCHEME/2015 SCHEME (PAPER II)/2015 & 2010 SCHEME)

Saturday, June 17, 2017

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

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

1. **Essay Questions:**

1A. Mention any three actions of growth hormone. Describe the regulation of secretion of growth hormone in the form of a flow chart.

1B. Draw a labeled diagram of the visual pathway and explain the effect of lesion of left optic nerve.

1C. Classify white blood cells. Mention one function of each.

1D. Describe the chemical regulation of respiration.

(5 marks × 4 = 20 marks)

2. **Short answer questions:**

2A. List two differences between active transport and passive transport mechanisms.

2B. Draw a labeled diagram of a nerve action potential.

2C. Mention any two functions of cerebrospinal fluid.

2D. List any four properties of cardiac muscle.

2E. Define cardiac output and mention its normal value in adults at rest.

2F. Name the different types of hypoxia.

2G. Mention any two functions of gall bladder.

2H. Mention any two actions of estrogen.

2I. Define GFR and give its normal value.

2J. List two functions of basal ganglia.

(2 marks × 10 = 20 marks)

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# MANIPAL UNIVERSITY

## FIRST YEAR B.Sc. M.R.T. DEGREE EXAMINATION – JUNE 2017

### SUBJECT: BASIC AND APPLIED MATHEMATICS

**(2011 SCHEME)**

Tuesday, June 20, 2017

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

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✍ **Answer any FIVE full questions.**

1A. Define Null Set and using Venn diagram show that:

i) AUB ii) A ∩B iii) A-B iv) B-A v) Complement of A

1B. Evaluate: i) $\int \frac{x}{4x^2+7}dx$ ii) $\int \frac{e^x}{6-4e^x}dx$.

1C. Solve the differential equation Sec $x$ tan $x$ $dx$ + tan $y$ $dy$ = 0.

(4+6+6 = 16 marks)

2A. Find the total surface area of a cylindrical tin of radius 17 cm and height 3cm.

2B. If U={1,2,3,4,5,6,7,8,9}, A={1,2,4,6,8}, B={2,4,5,9} Compute the following:

i) $\bar{A}$ ii) $\bar{B}$ iii) $\overline{A \cap B}$ iv) $\overline{A \cup B}$ v) A-B vi) B-A

2C. Evaluate: $\lim_{x\to 0} \frac{\sqrt{3+x}}{x} - \frac{\sqrt{3-x}}{x}$.

(4+6+6 = 16 marks)

3A. Find the volume of a cylindrical canister with radius 7 cm and height 12 cm.

3B. Evaluate: i) $\int (\frac{x-1}{x^2})^2 dx$. ii) $\int (4x^3 - 1)dx$

3C. Find Derivative of sum of 2 functions y=u+v, using first principle.

(4+6+6 = 16 marks)

4A. If $ye^y = x$, then prove that $\frac{dy}{dx} = \frac{y}{x(1+y)}$.

4B. Determine the sets A and B, given that

i) A-B={1,2,4}, B-A={7,8} and A∪B={1,2,4,5,7,8,9}

ii) A-B={1,3,7,11}, B-A={2,6,8}, and A∩B={4,9}.

4C. Solve : i) Differentiate $y = x^2 \sin^2 3x$

ii) Differentiate $y = \sin^3(\sqrt{x})$

(4+6+6 = 16 marks)

5A. Solve the differential equation $(x+1)\frac{dy}{dx}+1=2e^{-y}$

5B. Define Power Set and with the help of Venn Diagram, show that $A\cap (B\cup C) = (A\cap B)\cup(A\cap C)$.

5C. Solve the equations:

i) $2x^2 + 3x + 2 = 4$ ii) $3x^2 - 6x + 7 = 0$

(6+4+6 = 16 marks)

6A. Find $\frac{dy}{dx}$ i) $y=\frac{x}{2}+\frac{2}{x}-2x^2$ ii) $y=\frac{x^n-n^x}{e^x}$.

6B. Find x from $x\sin^2 45°.\cos^2 30° = \frac{\tan 45°.\cot^2 30°}{\sin^2 60°+\operatorname{cosec}^2 30°}$

6C. Evaluate: i) $\lim_{n\to\infty}\frac{n^2+n+1}{3n^2+2n-1}$ ii) $\lim_{n\to\infty}\frac{n+1}{\sqrt{4n^2-3}}$

(6+4+6 = 16 marks)