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Total No. of Questions : 10]

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PHM-1.1.2  
REMEDIAL MATHS

(B.Pharmacy, 1st Semester)

Time : 3 Hours

Maximum Marks : 40

**Note** :- This paper consists of Three Sections. Section A is compulsory. Attempt any *Four* questions from Section B and *Three* from Section C.

Section-A Marks : 1 Each

1. (a) Most important objectives of statistical analysis to get :
  - (i) Range
  - (ii) A single value
  - (iii) Mid-value
  - (iv) All
- (b) The pie diagram (pie chart) is used to represent :
  - (i) Frequency
  - (ii) Relative frequency
  - (iii) Cumulative frequency
  - (iv) All

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Turn Over

Z-3

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(c) In a bimodal series Mode = .....  
Median - ..... Mean.

(d) What is the order and degree of the following differential equation :

(i)  $\frac{d^2y}{dx^2} + y = 0$

(ii)  $\left(\frac{d^2y}{dx^2}\right)^2 + x^2 \left(\frac{dy}{dx}\right)^2 = 0.$

(e) If  $\tan \theta = t$ , find all  $t$  ratios of  $\theta$  in terms of  $t$ .

(f) Find the value of  
 $\tan^2 60^\circ + 4 \cos^2 45^\circ + 3 \sec^2 30^\circ + 5 \cos^2 90^\circ.$

(g) Prove that :

$$\frac{1 + \sin \theta}{1 - \sin \theta} = \sec \theta + \tan \theta.$$

(h) Prove that :

$$\sin 51^\circ + \cos 81^\circ = \cos 21^\circ.$$

(i) Mean of a finite number of observation is 5. If each observation is increased by 2, find the new mean.

(j) Differentiate  $e^{2x} \cdot \sin 3x$ .

(k)  $\int \sin x \cdot \cos x \cdot dx = \dots\dots\dots$

(l) Evaluate  $\int_0^1 (2x + 3) \cdot dx$ .

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(m)  $\begin{bmatrix} 2 & 0 \\ 0 & 6 \end{bmatrix}$

- (i) Diagonal matrix
- (ii) Null matrix
- (iii) Scalar matrix
- (iv) None.

(n) Find  $3A - 2B$  if  $A = \begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{bmatrix}$  and  $B = \begin{bmatrix} 7 & 6 & 3 \\ 1 & 4 & 5 \end{bmatrix}$

$$B = \begin{bmatrix} 7 & 6 & 3 \\ 1 & 4 & 5 \end{bmatrix}$$

(o) Find the slope of a line whose inclination is  $\pi/3$ .

### Section-B

2. The postal expenses on the letters sent from the office and given day is as follows following distribution :

Postage (in Paise)	15	30	45	60
No. of letters	47	30	20	10

Find the mean postage per letter.

3. Prove that :

$$\frac{\sin 8\theta \cdot \cos \theta - \cos 8\theta \cdot \sin \theta}{\cos 2\theta \cdot \cos \theta - \sin 2\theta \cdot \sin \theta} = \tan 2\theta$$

4. Evaluate  $\int \tan^3 2x \cdot \cos 2x$

5. Find the value of  $x$  which satisfies the equation :

$$\begin{bmatrix} x+2 & 3x-1 \\ x-2 & 3x+1 \end{bmatrix} = \begin{bmatrix} 3x-1 & x+2 \\ x-2 & 3x+1 \end{bmatrix}$$

2. A straight line is drawn through the point (1, 1) such that the portion of the line intercepted between the axes is divided at this point in the ratio 1:2. Find the equation of line.

Marks : 5x3=15

3. Differentiate  $\sin^{-1} \frac{1}{x}$  with respect to  $x$  and prove that  $\frac{dy}{dx} = \frac{-1}{x^2 \sqrt{1-x^2}}$

$$\cot(60^\circ - A) = 3 \cot 3A$$

4. The following data are given below, find the mean and standard deviation.

Class	No. of candidates
4-6	7
6-8	10
11-13	16
15-17	30
19-21	24

5. Prove that  $\tan^{-1} \frac{1}{x} + \tan^{-1} \frac{1}{y} = \tan^{-1} \left( \frac{x+y}{1-xy} \right)$  if  $xy < 1$ .

$$\tan^{-1} \frac{1}{x} + \tan^{-1} \frac{1}{y} = \tan^{-1} \left( \frac{x+y}{1-xy} \right)$$