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Total No. of Questions: 10]



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PHM-1.1.2 REMEDIAL MATHS.

(B.Pharm., 1st Semester, 2054)

Time: 3 Hours

Maximum Marks: 40

Note: - Section A is compulsory. Attempt any Four questions from Section B and any Three questions from Section C.

Section-A

Marks: 1 Each

1. (a) If $A = 30^{\circ}$ verify that

 $\sin 3A = 3 \sin A - 4 \sin^3 A$.

(b) Prove that:

$$\sin 75^{\circ} = \frac{\sqrt{6} + \sqrt{2}}{4}$$
.

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Additional data (c) Find the value of

 $\sin 30^{\circ} \cdot \cos 0^{\circ} + \sin 45^{\circ} \cdot \cos 45^{\circ} + \sin 60^{\circ} \cdot \cos 30^{\circ}$.

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

(i)
$$x.dx + y.dy = 0$$

(ii)
$$x^2 \cdot \frac{d^2y}{dx^2} - xy \cdot \frac{dy}{dx} = y$$
.

(e) Differentiate x^{28} from the first principle.

man!

(f) Evaluate:

$$\int_0^{\pi/2} (5 \sin x + 2 \cos x) . dx.$$

- (g) If x increase from 3 to 3.1 find the corresponding change in y = 2x + 1.
- (h) Prove that:

$$\frac{1-\sin\theta}{1+\sin\theta}=(\sec\theta-\tan\theta)^2.$$

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by short cut method.



- Write the formula for calculating the mean
- (j) A contractor employs three types of workers, male, female and children. To a male worker he pays Rs. 40 per day, to a female worker Rs. 32 per day and to a child worker Rs. 21 per day. What is the average

wage per day paid by the contractor?

(k) Evaluate:

(i)

$$\int \frac{dx}{1+\sin x}.$$

- (I) $\begin{bmatrix} 2 & 2 \\ 0 & 2 \end{bmatrix}$ is an example of:
 - (i) Scalar matrix
 - (ii) Null matrix
 - (iii) Diagonal matrix
 - (iv) None of these

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- (m) $\lim_{x\to 2} \frac{|x-2|}{|x-2|}$ exist or does not exist.
- (n) Find the product of AB of two matrices A and B where

$$A = \begin{bmatrix} 1 \\ 2 \\ 3 \end{bmatrix}$$
 and $B = [2, 3, 4, 5]$.

(o) Find the slope of a line whose inclination is $\pi/6$.

Section-B Marks:
$$2\frac{\tau}{2}$$
 Each

2. Prove that:

$$\cos^2 A + \cos^2 B - 2 \cos A \cdot \cos B \cdot \cos (A + B)$$

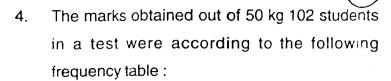
= $\sin^2 (A + B)$.

3. Evaluate:

$$\int \frac{dx}{3\sin x + 4\cos x}.$$

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Marks	No. of Students
20	8
22	15
23	28
24	27
26	20
31	,2
38	1
43	1

Obtain the median.

5. If

$$A = \begin{bmatrix} 1 & 2 & -1 \\ 2 & 3 & -1 \\ 3 & 4 & -1 \end{bmatrix} \text{ and } B = \begin{bmatrix} 1 & -3 & -5 \\ -1 & 3 & -5 \\ -1 & 3 & -5 \end{bmatrix},$$

calculate AB.

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- 6. Find the equation of the straight line which passes through the point (3, 4) and has intercept on the axes:
 - (a) equal in magnitude but opposite in sign
 - (b) such that their sum is 14.

Section-C Marks: 5 Each

- 7. If $A + B + C = 180^{\circ}$, prove that : $\cos^2 A + \cos^2 B + \cos^2 C = 1 - 2 \cos A.\cos B.\cos C.$
- 8. Given that:

$$y = \frac{5x}{(1-x)^{213}} + \cos^2(2x+1).$$

Show that

$$\frac{dy}{dx} = \frac{5}{3}(1-x)^{-513}.(3-x) - 2\sin(4x+2).$$

9. Evaluate:

$$\int_{a} \sin^{-1} \sqrt{\frac{x}{a+x}} . dx.$$

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10. From the following data compute arithmetic mean by direct and short-cut method:

Marks	No. of Students
0-10	5
10–20	10
20–30	25
30–40	30
40–50	20

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