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B.Pharmacy (Semester - 1st)

REMEDIAL MATHEMATICS (PHM - 1.1.2(M))

Time : 03 Hours **Maximum Marks : 80**

Instruction to Candidates:

1) Section - A is **compulsory.**
2) Attempt any **Four** questions from Section - B.
3) Attempt any **Three** questions from Section - C.

Section - A

Q1) *(15 x 2 = 30)*

a) Solve the equation $x + \sqrt{x} = 3/2$.

b) Solve the equation $x^2 + 5x + 4 = 0$.

c) Find the value of the determinant $D = \begin{vmatrix} 0 & 0 & 1 \\ 1 & 2 & 3 \\ 4 & 5 & 6 \end{vmatrix}$.

d) Calculate the Minor of 15 in the det $D = \begin{vmatrix} 1 & 15 & 6 \\ 7 & 8 & 7 \\ 1 & 2 & 3 \end{vmatrix}$.

e) If $A = \begin{bmatrix} \cos\alpha & \sin\alpha \\ -\sin\alpha & \cos\alpha \end{bmatrix}$, verify that $AA^T = I = A^T A$.

f) Define square & rectangular matrices.

g) Define median.

P.T.O.

h) If $\sin A = \frac{1}{7}$, find $\cos 2A$.

i) Prove that $\tan\alpha + \cot\alpha = 2 \operatorname{cosec} 2\alpha$.

j) Find the equation of the line passing through the point (1, 2) (–1, 2).

k) Find the equation of a straight line parallel to the y - axis & at a distance 6 units to the left of it.

l) Find $\frac{dy}{dx}$ if $y^2 = 4ax$.

m) Find $\frac{dy}{dx}$ if $y = a^x$.

n) Calculate $\int \frac{-50}{1+x^2} dx$.

o) Calculate $\int_0^1 x^{30} dx$.

Section - B

(4 x 5 = 20)

Q2) Solve $x + \sqrt{x} = 6/25$.

Q3) Find the inverse of the matrix $\begin{bmatrix} 1 & 1 & 3 \\ 1 & 3 & -3 \\ -2 & -4 & -4 \end{bmatrix}$.

Q4) Prove that $\sqrt{\frac{1+\cos\theta}{1-\cos\theta}} = \operatorname{cosec}\theta + \cot\theta$.

Q5) Find $\frac{dy}{dx}$ when $x = a\cos 2\theta$, $y = a\sin 2\theta$.

Q6) Calculate $\int x^2 e^x dx$.

Section - C

(3 x 10 = 30)

Q7) Solve the system of equations

$$x + y + 2z = 4$$
$$2x - y + 3z = 9$$
$$3x - y - z = 2$$

by matrix method.

Q8) Find the equations of the sides of a rectangle whose vertices are (3, 2), (11, 8), (8, 12) & (0, 6).

Q9) If $x = a(\theta - \sin\theta)$, $y = a(1 - \cos\theta)$, find $\frac{d^2y}{dx^2}$.

Q10) Evaluate $\int \frac{x \sin^{-1} x}{\sqrt{1-x^2}} dx$.