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Total No. of Questions : 10] [Total No. of Pages : 03

B.Pharmacy (Sem.-1st)

REMEDIAL MATHEMATICS

SUBJECT CODE :PHM - 1.1.2 (M)

Paper ID : [D0102]

[Note : Please fill subject code and paper ID on OMR]

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 × 2 = 30)*

a) Find the value of x such that $[1 \quad 1 \quad x]\begin{bmatrix}1 & 0 & 2\\ 0 & 2 & 1\\ 2 & 1 & 0\end{bmatrix}\begin{bmatrix}1\\1\\1\end{bmatrix}=0$

b) Prove that $\sqrt{\sec^2 A + \operatorname{cosec}^2 A} = \sec A \operatorname{cosec} A$.

c) Without expanding prove that determinant

$$\begin{vmatrix} a-b & b-c & c-a \\ b-c & c-a & a-b \\ c-a & a-b & b-c \end{vmatrix} = 0$$

d) Integrate $\frac{1-\cos 2x}{2}$.

e) Determine median of rain fall

DAY	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Rain Fall (CMS)	2.2	4.0	4.8	5.1	3.8	4.2

f) Evaluate $\lim_{x \to 0} \frac{e^{\sin x} - 1}{x}$

g) Find the value of x for which the points $(x, -1)$ $(2,1)$ and $(4, 5)$ are collinear.

h) Differentiate $\sin(x^2 + 2x + 3) + \log(\sin x)$ w.r.t 'x'.

i) Prove that $\frac{\sin A + \sin B}{\sin A - \sin B} = \tan\frac{(A+B)}{2} \cdot \cot\frac{A-B}{2}$.

j) Find the equation of straight live passing through origin making an angle $\tan^{-1}(1/3)$ with X – axis.

k) If $f(x) = e^{5x}$ and $g(x) = \log x$ find fog (x) and gof (x).

l) In a moderately Skewed distribution the value of mean and mode are 5 and 8 respectively find median.

m) $A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$ $B = \begin{bmatrix} 4 & 3 \\ 2 & 1 \end{bmatrix}$ show that $AB \neq BA$.

n) What are applications of mensuration in pharmaceutical.

o) $\int \frac{e^{2x}}{e^{2x} - 2} dx$.

Section - B

(4 × 5 = 20)

Q2) Prove that $\begin{vmatrix} a+b+2c & a & b \\ c & b+c+2a & b \\ c & a & c+a+2b \end{vmatrix} = 2(a+b+c)^3$.

Q3) Show that $\cos 52 + \cos 68 + \cos 172 = \cos 20 + \cos 100 + \cos 140$.

Q4) Show that the points (5,1), (1,–1) and (11,4) lie on a straight line. Also find the equation of straight line.

Q5) Find dy/dx when $ax^2 + 2hxy + by^2 + 2gx + 2fy = 0$.

Q6) Evaluate $\int \sec^3 x \, dx$.

Section - C

(3 × 10 = 30)

Q7) Calculate mean and median

Salary (in Rs.)	90-110	110-130	130-150	150-170	170-190	190-210	210-230	230-250
No. of workers	55	60	70	100	65	30	20	10

Q8) Solve the system of equations using matrix method

$2x - y + z + 3 = 0$
$3x - z + 8 = 0$
$2x + 6y - 2 = 0$

Q9) (a) Find the ratio in which the line joining (3, –6) and (–6, 8) is cut by $x - ax$ is.

(b) Prove that $\tan 13x - \tan 9x - \tan 4x = \tan 13x \tan 9x \tan 4x$.

Q10) (a) If $x^y = e^{x-y}$ prove that $\frac{dy}{dx} = \frac{\log x}{(1 + \log x)^2}$.

(b) Evaluate $\int_0^{\pi/2} \frac{\sqrt{\sin x}}{\sqrt{\sin x} + \sqrt{\cos x}} dx$.