Roll No.....

Total No. of Questions : 10]

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P.H.M.–1.1.2

REMEDIAL MATHEMATICS

(B.Pharmacy., 1st Semester, 2124)

Time : 3 Hours Maximum Marks : 80

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

Section–A Marks : 2 Each

1. (a) Solve :

$$\sqrt{6+\sqrt{6+\sqrt{6+.....\infty}}} = x.$$

(b) Prove that :

$$\begin{vmatrix} 1 & a & b+c \\ 1 & b & c+a \\ 1 & c & a+b \end{vmatrix} = 0.$$

(b) [illegible] the value of x such that :

$$x^2\begin{bmatrix}2\\1\end{bmatrix}+x\begin{bmatrix}-3\\1\end{bmatrix}-\begin{bmatrix}-1\\2\end{bmatrix}=0.$$

(c) Find the matrices A and B for the following :

$$A+B=\begin{bmatrix}1&2\\3&4\end{bmatrix}, 2A-3B=\begin{bmatrix}[illegible]&[illegible]\\7&[illegible]\end{bmatrix}$$

(e) Find the mean of 50 observations when it is given that the mean of 32 of them is 28 [illegible] mean of [illegible] observations is 30.

(f) Prove :

[illegible] cos 390° [illegible]

(g) [illegible] that :

$$\frac{\sin\theta+\sin 3\theta}{\cos\theta+\cos 3\theta}=\tan 2\theta.$$

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(26)

(h) Evaluate :

$$\frac{\tan(90 - \theta)\sec(180 - \theta)\sin(-\theta)}{\sin(180 + \theta)\cot(360 - \theta)\operatorname{cosec}(90 - \theta)}$$

(i) Prove that the points (–3, –7), (4, 7) and (5, 9) are collinear.

(j) Prove that the lines $x + 3y + 4 = 0$ and $2x + 6y - 7$ are parallel.

(k) Find the equation of the line passing through the mid-point of the line segment joining the points (1, 3) and (2, –1) and parallel to the line $3x - y = 7$.

(l) Evaluate :

$$\lim_{x \to 2} \frac{x^2 + 3x - 10}{x^2 - 9x + 14}$$

(m) Differentiate $x^{\log x}$ with respect to x.

(n) Evaluate :

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

(4)

$$\int \frac{7x + 2}{3x + 5}\, dx.$$

Section–B

2.

$$\begin{vmatrix} a^2 + 2a & 2a + 1 & \\ 2a + 1 & a - 2 & \\ 3 & 3 & \end{vmatrix}$$

3.

$$A = \begin{vmatrix} & & 3 \\ 2 & 1 & \\ 5 & & 11 \end{vmatrix}$$

4.

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

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(27)

(5)

5. [illegible] frequency distribution is 46. find the missing frequencies.

Class	f
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
50–60	[illegible]
60–70	[illegible]
70–80	[illegible]
[illegible]	[illegible]

6. [illegible] equation [illegible]

7. Find dy/dx [illegible]

$$x = \frac{1 - t^2}{1 + t^2} \quad y = \frac{2t}{1 + t^2}$$

1-28

(b) If $\sin y = x \sin (a + y)$, prove that

$$\frac{dy}{dx} = \frac{\sin^2 (a + y)}{\sin a}$$

8. (a) If

$$x\sqrt{1 + y} + y\sqrt{1 + x} = 0,$$

prove that

$$\frac{dy}{dx} = -\frac{1}{(1 + x)^2}$$

(b) Evaluate :

$$\int x \log x^2 \, dx.$$

9. (a) Evaluate :

$$\int \frac{1}{x^2} \cos\left(\frac{1}{x}\right) dx.$$

(b) Evaluate :

$$\int_a^b f(x) dx,$$

(28)

Where

$$f(x) = \begin{cases} 2x - 1, & 2 \leq x \leq 1 \\ 3x - [illegible], & 1 \leq x \leq [illegible] \end{cases}$$

10. Evaluate :

$$\int [illegible] \, dx$$

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