L.C 18.12.23

M 156/101

Enrolment Number										

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B.Pharm Semester Examinations

REMEDIAL MATHEMATICS - THEORY

Course Code: BP106RMT

Full Marks – 35 **Time – 1.5 hours**

The figure in the margin indicates full marks for the questions.

1. Answer any five of the following: $5 \times 5 = 25$

a) Find the equation of the line passing through the point (2, 2) and cutting off intercepts on the axes whose sum is 9.

b) If the angle between two lines is $\frac{\pi}{4}$ and the slope of one of the lines is $\frac{1}{2}$, find the slope of the other line.

c) If $A = \begin{bmatrix} 1 & 0 & 2 \\ 0 & 2 & 1 \\ 2 & 0 & 3 \end{bmatrix}$, prove that $A^3 - 6A^2 + 7A + 2I = 0$.

d) Find the inverse of the matrix $A = \begin{bmatrix} 1 & 3 & -2 \\ -3 & 0 & -5 \\ 2 & 5 & 0 \end{bmatrix}$

e) Solve: (By Cramer's rule)

2x+3y+3z=5; x-2y+z=-4; 3x-y-2z=3

f) Evaluate the following limits:

i) $\lim_{x \to 0} \frac{\sqrt{2-x} - \sqrt{2+x}}{x}$ ii) $\lim_{x \to -3} \frac{x^3 + 4x^2 + 4x + 3}{x^2 + 2x - 3}$

g) Find $\frac{dy}{dx}$ if

i) $y = \sqrt{\frac{1+x}{1-x}}$ ii) $y = (x^2 + 3)^4 (x + 1)$

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2. Answer any one of the following: $1\times10=10$

a) i) Resolve the following fraction in to partial fraction: $\frac{x^4}{x^4-16}$

ii) Define diagonal, scalar and identity matrices with an example of each. Distinguish between each of them with proper justification.

b) i) Solve the following system of equations by matrix method:

x-y+2z=7; 3x+4y-5z=-5; 2x-y+3z=12

ii) If $A=\begin{bmatrix} 0 & -\tan\frac{\alpha}{2} \\ \tan\frac{\alpha}{2} & 0 \end{bmatrix}$ and 'I' is the identity matrix of order 2x2, then show that

$$I+A=(I-A)\begin{bmatrix} \cos\alpha & -\sin\alpha \\ \sin\alpha & \cos\alpha \end{bmatrix}$$