

B. Pharm. First Semester (New)
35307 : BP 106 RMT - Remedial Mathematics

P. Pages : 2

Time : Three Hours



AU - 0706

Max. Marks : 75

- Notes : 1. Answer all question.
 2. Assume suitable data wherever necessary.

1. Evaluate the following. 20

- a) Prove that $\tan x + \cot x = \sec x \operatorname{cosec} x$.
- b) Prove that $\cos(A + B) \cos(A - B) = \cos^2 A - \sin^2 B$
- c) Evaluate $\lim_{x \rightarrow 3} \frac{\log x - \log 3}{x - 3}$
- d) $y = x^x$ find $\frac{dy}{dx}$
- e) $y = (x^2 + 5) \sin x$ find $\frac{dy}{dx}$
- f) $\lim_{x \rightarrow -2} (3x^2 + 5kx - 11) = -29$ find k.
- g) $A = \begin{bmatrix} 0 & 1 & -1 \\ 3 & -2 & 3 \\ 2 & -2 & 3 \end{bmatrix}$ Show $A^2 = I$
- h) Find Laplace Transform of $5e^t + \sinh 4t$
- i) Find value of x if $\begin{vmatrix} x & 5 \\ 3 & -4 \end{vmatrix} = 0$
- j) Define the differential equation & given one example.

2. Attempt any two. 20

- a) Evaluate $\int_0^{\pi/4} \log(1 + \tan x) dx$
- b) Show that $2x^2 + 7xy + 3y^2 - 5x - 5y + 2 = 0$ represents pair of straight lines & find acute angle betⁿ them.
- c) $y = A \cos(\log x) + B \sin(\log x)$ form the D. E. by eliminating the arbitrary constant A & B.

3. Attempt **any seven** from following.

a) $A = \begin{bmatrix} 1 & 3 & 3 \\ 3 & 1 & 3 \\ 3 & 3 & 1 \end{bmatrix}$ Show $A^2 - 5A$ is scalar matrix.

b) Find laplace transform of $\sin^3 2t$

c) Find value of x from $\begin{vmatrix} 1 & x & x^2 \\ 1 & 2 & 4 \\ 1 & 3 & 9 \end{vmatrix} = \begin{vmatrix} 1 & 1 \\ 2 & 2 \end{vmatrix}$

d) Evaluate $\int_0^{\pi/2} \frac{dx}{1 + \sqrt{\cot x}}$

e) Evaluate $\lim_{x \rightarrow \pi/2} \frac{\sqrt{2} - \sqrt{1 + \sin x}}{\cos^2 x}$

f) $y = \log\left(\frac{\sin x}{1 + \cos x}\right)$ find $\frac{dy}{dx}$

g) Find $\frac{dy}{dx}$ for $y = (\sin x)^x$

h) Prove that $\sqrt{\frac{1 - \cos A}{1 + \cos A}} = \operatorname{cosec} A - \cot A$

i) Evaluate $\int \sqrt{1 - \sin 2x} \, dx$
