

Chandigarh Engineering College Landran, Mohali
Department of Applied Sciences **CSE/IT/ECE/ME**

MST-1

Subject Name and Code: Mathematics-1

BTAM-104-18(CSE/IT) BTAM-101-18(ECE/ME)

1st Year / Semester :2020/1st

Time: 60 min

Name:

Max Marks: 24

Roll No.

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Date of Exam : 7/12/2020

Note: Section A is compulsory. Attempt any two questions from section B and two questions from section C.

Course Outcomes

CO1: analyze various problems by using fundamental theorems..

CO2: apply differential and integral calculus to evaluate definite, improper integrals and its applications.

CO3: deal with the concept of linear dependence, independence and linear transformations.

CO4: solve the linear equations by applying the knowledge of matrix algebra.

Section A (2 Marks)	Marks Distribution	Relevance to CO no.
<p>Q 1</p> <p>(a) Define linear dependence of vectors and give suitable example.</p> <p>(b) Define symmetric matrix and give suitable example.</p> <p>(c) find Sum and product of latent roots of the matrix $\begin{bmatrix} 2 & 1 \\ 2 & 3 \end{bmatrix}$.</p> <p>(d) Verify Rolle's theorem for $f(x) = x(2 - x)e^{3x/4}$, $x \in [0, 2]$</p>	<p>1+1</p> <p>1+1</p> <p>1+1</p> <p>2</p>	<p>(CO-3)</p> <p>(CO-4)</p> <p>(CO-3)</p> <p>(CO-1)</p>
Section B (4 Marks)	Marks Distribution	Relevance to CO no.
<p>Q2 For what values of λ and μ does the system of equations $x + y + z = 6$, $x + 2y + 3z = 10$, $x + 2y + \lambda z = \mu$ has</p> <p>(i) No solution</p> <p>(ii) Infinitely many solutions</p> <p>(iii) Unique solution</p> <p>Q3 Find approximate value of $\tan^{-1}(1.1)$ using Taylor's series of one variable.</p> <p>Q4 Define orthogonal matrix. Is the matrix $\begin{bmatrix} 4 & 2 & 1 \\ 6 & 3 & 4 \\ 2 & 1 & 0 \end{bmatrix}$ orthogonal?</p>	<p>1+1+1+1</p> <p>1+3</p> <p>1+3</p>	<p>(CO-4)</p> <p>(CO-1)</p> <p>(CO-4)</p>

Section C (4 Marks)	Marks Distribution	Relevance to CO no.
<p>Q5 Find Eigen values & Eigen vectors of the matrix $\begin{bmatrix} -1 & 2 & -2 \\ 1 & 2 & 1 \\ -1 & -1 & 0 \end{bmatrix}$</p>	2+2	(CO-3)
<p>Q6 Prove $\lim_{x \rightarrow 0} \left(\frac{\tan x}{x} \right)^{1/x^2} = e^{1/3}$</p>	4	(CO-1)
<p>Q7 Solve by Cramer's Rule $2x + 3y - z = 1$, $4x + y - 3z = 11$, $3x - 2y + 5z = 21$</p>	1+1+1+1+1	(CO-4)