	Pimpri Chinchwad Education Trust's **Pimpri Chinchwad College of Engineering** An Autonomous Institute (Permanently affiliated to Savitribai Phule Pune University)	SET – I SEMESTER - I
	Summative Assessment	

First Year B. Tech. (All)

Linear Algebra & Univariate Calculus

[BSH21BS01]

(Regulation: 2023)

Odd Semester (2024-25)

Total No. of Questions-04 ***Total No. of Printed Pages-02***

[Time: 1 Hr. 15 min.] ***[Max. Marks: 30]***

PRN

Instructions:

IMP: Verify that you have received a question paper with correct course, code, branch etc.
i. All questions are compulsory.
ii. Assume suitable data wherever necessary.
iii. Neat labelled diagrams must be drawn wherever necessary.
iv. Figure to right indicates full marks.
v. Use of a non-programmable calculator is allowed.

		Marks
Q.1	**Attempt the following.**	**[8M]**
A	Examine the consistency and solve, $x + y + z = 6$ $2x + y + 3z = 13$ $5x + 2y + z = 12$ $2x - 3y - 2z = -10$.	[4M]
B	Find eigen values & eigen vector corresponding to the largest eigen value of the following matrix, $\begin{bmatrix} 2 & 1 & 1 \\ 2 & 3 & 2 \\ 3 & 3 & 4 \end{bmatrix}$.	[4M]
Q.2	**Attempt the following**	**[7M]**
A	Evaluate $\lim_{x \to 0} x^x$.	[3M]
B	If $y = e^{\tan^{-1} x}$ then prove that $(1 + x^2)y_{n+2} - (2(n+1)x - 1)y_{n+1} + n(n+1)y_n = 0.$	[4M]
Q.3	**Attempt the following**	**[6M]**
A	Find orthogonal trajectory for $x + y = c$.	[2M]

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B	Solve any ***one*** of the following i. A steam pipe $20cm$ in diameter contains steam at $100^{\circ}c$ and protected with covering $5cm$ thick, given $k = 0.01$. If temperature of outer surface of covering is $20^{\circ}c$. Find temperature at $x = 8.2\ cm$ from centre of pipe. ii. Solve $(3xy^2 - y^3)dx + (xy^2 - 2x^2y)dy = 0$.	[4M] [4M]
Q.4	**Attempt the following**	**[9M]**
A	Solve any **one** of the following. i. Solve $(D^2 - 4D + 4)y = x\,e^{2x}$. ii. Solve $(D + 1)y = e^{e^x}$.	[4M] [4M]
B	Solve by Method of Variation of Parameters, $(D^2 + 1)y = \sec x$.	[5M]

****** End of Question Paper******