BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(MID SEMESTER EXAMINATION)

CLASS: IMSC **SEMESTER : III**
BRANCH: QEDS **SESSION : MO/2025**

SUBJECT: ED24201 DIFFERENTIAL EQUATIONS

TIME: 02 HOURS **FULL MARKS: 25**

INSTRUCTIONS:
1. The question paper contains 5 questions each of 5 marks and total 25 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
***4*. Tables/Data handbook/Graph paper etc., if applicable, will be supplied to the candidates**

			CO	BL
Q.1(a)	Find the slope field and graphical solution of 1st order ODE: $y' = y - t$	[2]	1	
Q.1(b)	Apply Euler's numerical method to find an approximate value $y(1.5)$ using the 1st order ODE as an initial value problem: $y' = y - t, y(1) = 1.$	[3]	1	
Q.2(a)	Solve the first linear ODE $y' = 2y + t$ using variation of parameters	[2]	2	
Q.2(b)	Solve the first linear ODE $y' = 2y + t$ using integrating factor and plot the graph of solutions.	[3]	2	
Q.3(a)	Find the two independent solution of the 2nd order linear ODE $y'' + y = 0$ by the method of inspection.	[2]	3	
Q.3(b)	Solve the 2nd order linear ODE: $y'' - 2y' + y = 0$	[3]	3	
Q.4(a)	Find the solution of the 2nd order linear ODE $y'' + 3y' + 2y = 0$	[2]	3	
Q.4(b)	Solve the 2nd order linear ODE: $t^2y'' + 4ty' + 2y = 0$	[3]	3	
Q.5(a)	Solve 2nd order linear and inhomogeneous ODE: $y'' + 4y' + 3y = e^t$	[2]	3	
Q.5(b)	Solve 2nd order linear and inhomogeneous ODE $y'' + y = \sin(t)$	[3]	3	

:::::16/09/2025:::::E