SNS COLLEGE OF TECHNOLOGY

(An Autonomous Institution)

Approved by AICTE, New Delhi, Affiliated to Anna University, Chennai

Accredited by NAAC-UGC with 'A++' Grade (Cycle III) ; Accredited by NBA (B.E - CSE, EEE, ECE, Mech ; B.Tech.IT) COIMBATORE-641 035, TAMIL NADU

DEPARTMENT OF MATHEMATICS

ORDINARY DIFFERENTIAL EQUATIONS

UNIT - II

Unit - II / Part - A / 2 Marks				
S.No	Questions	Mark Splitup	K - Level	CO
1.	Solve $(D^2+5D+4)=0$.	2	K2	CO2
2.	Solve $\frac{d^2y}{dx^2}+2\frac{dy}{dx}-2y=0$.	2	K2	CO2
3.	Solve $\frac{d^4y}{dx^4}=16y$.	2	K2	CO2
4.	Solve $(D^4-2D^3+D^2)y=0$.	2	K2	CO2
5.	Solve $(D^4-2D^2+1)y=0$.	2	K2	CO2
6.	Solve $y'''+2y''+y'=0$.	2	K2	CO2
7.	Solve $(D^3+1)y=0$	2	K2	CO2
8.	Solve $(D^3+1)y=e^{-x}$.	2	K2	CO2
9.	Find the particular integral of $(D^3-4)y=e^{2x}$.	2	K2	CO2
10.	Find the particular integral of $(D^3+8)y=e^{-2x}$	2	K2	CO2
11.	Find the particular integral of $(D^2-a^2)y=e^{ax}$.	2	K2	CO2
12.	Find the particular integral of $(D-m)^2y=e^{mx}$	2	K2	CO2
13.	Find the complementary function of $(D^2+4)^2=\cos x$	2	K2	CO2
14.	Find the particular integral of $(D^4+D^2)y=\sin x$	2	K2	CO2
15.	Find the particular integral of $(D-1)^2=\sinh 2x$	2	K2	CO2
16.	Find the particular integral of $(D-1)^2y=\cosh 2x$	2	K2	CO2
17.	Find the particular integral of $\frac{d^2y}{dx^2}+4y=\sin 2x$.	2	K2	CO2

18.	Find the particular integral of $(D^4+D^2)y=\sin x$	2	K2	CO2
19	Find the particular integral of $(D^2+2)y=x^2$.	2	K2	CO2
20.	Find the particular integral of $(D+1)^2 y=e^{-x}\cos x$.	2	K2	CO2
21.	Find the particular integral of $(D^2-2D+5)y=e^x\sin 2x$	2	K2	CO2
22.	Find the particular integral of $(D^2-2D+5)y=e^x\sin 2x$	2	K2	CO2
23.	Reduce the equation $x^2\frac{d^2y}{dx^2}-x\frac{dy}{dx}+y=0$ to homogeneous differential equation with constant coefficients.	2	K2	CO2
24.	Solve $(x^2D^2+xD)y=0$.	2	K2	CO2
25.	Solve $x^2y''-2xy'+2y=0$.	2	K2	CO2
26.	Transform $(x+2)^2\frac{d^2y}{dx^2}-(x+2)\frac{dy}{dx}+y=3x+y$ in to differential equation with constant coefficients.	2	K2	CO2
27.	Eliminate x and find the equation in y from $\frac{dx}{dt}+5x-2y=t$; $\frac{dy}{dt}+2x+y+=0$.	2	K2	CO2

Unit - II / Part - B / 16, 8 Marks				
S.No	**Questions**	**Marks Splitup**	**K – Level**	**CO**
1.	Solve $(D^2+4D+3)y=e^{-x}\sin x+xe^{3x}$.	8	K2	CO2
2.	Solve $(4D^2-4D+1)y=4$.	8	K2	CO2
3.	Solve $(D^2-4D+13)y=e^{2x}\sin 3x$.	8	K2	CO2
4.	Solve $(D^2+5D+4)y=4e^{-x}+x$.	8	K2	CO2
5.	Solve $(D^2+4)y=x^2\cos 2x$.	8	K2	CO2
6.	Solve $(D^2+16)y=\cos^3 x$.	8	K2	CO2
7.	Solve $y''-2y'+y=xe^x\sin x$. .	8	K2	CO2
8.	Solve $(D^2+4D+5)y=e^x+x^3+\cos 2x+1$	8	K2	CO2
9.	Solve $(D^2+a^2)y=\tan ax$ by the method of variation of parameters.	8	K2	CO2
10.	Solve $(D^2+4)y=\sec 2x$ by the method of variation of parameters.	8	K2	CO2
11.	Solve $(D^2-4D+4)y=e^{2x}$ by the method of variation of parameters.	8	K2	CO2
12.	Solve $y''+9y=\cot 3x$. by the method of variation of parameters.	8	K2	CO2

13.	Solve $(D^2+1)y = x\sin x$ by the method of variation of parameters.	8	K2	CO2
14.	Solve $(D^2+1)y = cosecx$ by the method of variation of parameters.	8	K2	CO2
15.	Solve $x^2\frac{d^2y}{dx^2} - 3x\frac{dy}{dx} + 4y = x^3 + \cos(\log x)$.	8	K3	CO2
16.	Solve $(x^2D^2 - xD + 1)y = \left(\frac{\log x}{x}\right)^2$.	8	K3	CO2
17.	Solve $(x^2D^2 - 3xD + 5)y = x^2\sin(\log x)$.	8	K3	CO2
18.	Solve $x^2\frac{d^2y}{dx^2} + x\frac{dy}{dx} + y = \log x\sin(\log x)$	8	K3	CO2
19.	Solve $(3x+2)^2\frac{d^2y}{dx^2} + 3(3x+2)\frac{dy}{dx} - 36y = 3x^2 + 4x + 1$.	8	K3	CO2
20.	Solve $((1+x)^2D^2 + (1+x)D + 1)y = 4\cos[\log(1+x)]$	8	K3	CO2
21.	Solve $\left((1+x)^2D^2 + (1+x)D + 1\right)y = 2\sin\log(1+x)$.	8	K3	CO2
22.	Solve $(x+2)^2\frac{d^2y}{dx^2} - (x+2)\frac{dy}{dx} + y = 3x + 4$.	8	K3	CO2
23.	Solve the simultaneous equations $\frac{dx}{dt} + 2x - 3y = 5t; \frac{dy}{dt} - 3x + 2y = 0$ given that $x(0) = 0$ & $y(0) = -1$.	8	K3	CO2
24.	Solve the simultaneous equations $\frac{dx}{dt} + 2y + sint = 0$; $\frac{dy}{dt} - 2x - cost = 0$ given that $x = 0$ and $y = 1$ at $t = 0$.	8	K3	CO2
25.	Solve the simultaneous equations $\frac{dx}{dt} + 2y = 5e^t$; $\frac{dy}{dt} - 2x = 5e^t$ given that $x = -1$ and $y = 3$ at $t = 0$.	8	K3	CO2
26.	Solve the following simultaneous differential equations $\frac{dx}{dt} + 2y = \sin 2t$; $\frac{dy}{dt} - 2x = \cos 2t$.	8	K3	CO2
27.	Solve the following simultaneous differential equations $Dx + y = \sin 2t$; $-x + Dy = \cos 2t$.	8	K3	CO2
28.	Solve the following simultaneous differential equations $\frac{dx}{dt} - \frac{dy}{dt} + 2y = cos2t, \frac{dx}{dt} + \frac{dy}{dt} - 2x = sin2t$	8	K3	CO2