SRM Institute of Science and Technology
Ramapuram campus
Department of Mathematics
18MAB101T - Calculus and Linear Algebra

Year/Sem: I/I **Part – A Branch: Common to ALL Branches**

Unit – III Ordinary Differential Equations

1.	The order and degree of $\frac{d^2y}{dx^2}+3\frac{dy}{dx}+2y=e^{-2x}$ are	1 Mark	
	a)2, 1 b) 1, 2 c) 2, 2 d)1, 1	Ans (a)	(CLO-3 Remember)
2.	The order and degree of $\frac{d^2y}{dx^2}+3\left(\frac{dy}{dx}\right)^2+2y=\sin 3x$ are	1 Mark	
	a) 1, 2 b) 2, 1 c) 2, 2 d) 1, 1	Ans (b)	(CLO-3 Remember)
3.	The order and degree of $\left(\frac{d^2y}{dx^2}\right)^2+2\frac{dy}{dx}+y=5x$ are	1 Mark	
	a) 1, 2 b) 2, 1 c) 2, 2 d) 1, 1	Ans (c)	(CLO-3 Remember)
4.	The order and degree of $\frac{dy}{dx}+3y=5x$ are	1 Mark	
	a) 1, 2 b) 2, 1 c) 2, 2 d) 1, 1	Ans (d)	(CLO-3 Remember)
5.	The number of arbitrary constants in the solution of a differential equation is equal to the _____ of that differential equation.	1 Mark	
	a) degree b) number of variables c) order d) number of terms	Ans (b)	(CLO-3 Remember)
6.	The number of arbitrary constants in the most general solution of n^{th} order differential equation is _____	1 Mark	
	a) 1 b) n – 1 c) n d) n + 1	Ans (c)	(CLO-3 Remember)
7.	The solution of $(D^3 – D^2 + D – 1)y = 0$ is	1 Mark	
	a) $y = Ae^x + B \cos x + C \sin x$ b) $y = Ae^x + B \cos x – C \sin x$ c) $y = Ae^{-x} + B \cos x + C \sin x$ d) $y = Ae^x + B \cosh x + C \sinh x$	Ans (a)	(CLO-3 Remember)
8.	The complementary function of $(D^2 + D + 1)y = 0$ is	1 Mark	

	a) $e^{\frac{1}{2}x}\left(C_1\cos\frac{\sqrt{3}}{2}x+C_2\ \sin\frac{\sqrt{3}}{2}x\right)$ b) -1, 2 c) $e^{\frac{-1}{2}x}\left(C_1\cos\frac{\sqrt{3}}{2}x+C_2\ \sin\frac{\sqrt{3}}{2}x\right)$ d) $\cos x+i\sin\ x$	Ans (c)	(CLO-3 Remember)
9.	The complementary function of $\frac{d^2y}{dx^2}-8\frac{dy}{dx}+15y=0$	1 Mark	
	a) $C_1e^{-5x}+C_2e^{-3x}$ b) $C_1e^{4x}+C_2e^{4x}$ c) $C_1e^{5x}+C_2e^{3x}$ d) $C_1e^{2x}+C_2e^{6x}$	Ans (c)	(CLO-3 Remember)
10.	The complementary function of $\frac{d^2y}{dx^2}+6\frac{dy}{dx}+9y=3e^{4x}$	1 Mark	
	a) $C_1e^{-3x}+C_2e^{-3x}$ b) $C_1e^{3x}+C_2e^{3x}$ c) $(C_1+C_2\ x)e^{-3x}$ d) $(C_1+C_2\ x)e^{3x}$	Ans (c)	(CLO-3 Remember)
11.	The complementary function of $(D^2 + 4)y = x \sin x$ is	1 Mark	
	a) $C_1e^{-3x}+C_2e^{-3x}$ b) $C_1e^{3x}+C_2e^{3x}$ c) $C_1\cos 2x+C_2\sin 2x$ d) $(C_1+C_2\ x)e^{3x}$	Ans (c)	(CLO-3 Remember)
12.	The particular integral of $(D^3 – D^2 + D – 1)y = 0$ is	1 Mark	
	a) 0 b) Ae^x + Bcos x – Csin x c) Bcos x + Csin x d) Ae^x + Bcosh x + Csinh x	Ans (a)	(CLO-3 Remember)
13.	The particular integral of $(D^2 + 2D + 1)y = 5$ is	1 Mark	
	a) 0 b) 5 c) 2 d) 1	Ans (b)	(CLO-3 Remember)
14.	The particular integral of $(D^2 + 9)y = e^{-2x}$ is	1 Mark	
	a) $\frac{e^{-2x}}{15}$ b) $\frac{e^{2x}}{15}$ c) $\frac{e^{-2x}}{13}$ d) $\frac{e^{-2x}}{14}$	Ans (c)	(CLO-3 Remember)
15.	The particular integral of $(D^2 + 16)y = e^{-4x}$ is	1 Mark	
	a) $\frac{x}{32}e^{-4x}$ b) $\frac{1}{32}e^{-4x}$ c) $\frac{x}{16}e^{-4x}$ d) $\frac{1}{16}e^{-4x}$	Ans (b)	(CLO-3 Remember)
16.	The particular integral of $(D – 1)^2 y = e^x$ is	1 Mark	
	a) $\frac{x}{32}e^{-4x}$ b) $\frac{x^2}{2}e^{x}$ c) $\frac{x}{16}e^{-4x}$ d) $\frac{1}{16}e^{-4x}$	Ans (b)	(CLO-3 Remember)

17.	The particular integral of $(D^2 + a^2)y = \cos ax$ is	1 Mark	
	a) $\frac{-x}{2a}\sin ax$ b) $\frac{-x}{2a}\cos ax$ c) $\frac{x}{2a}\cos ax$ d) $\frac{x}{2a}\sin ax$	Ans (d)	(CLO-3 Remember)
18.	The particular integral of $(D^2 + 4)y = \sin 2x$ is	1 Mark	
	a) $\frac{x}{2}\sin x$ b) $\frac{-x}{2}\sin x$ c) $\frac{-x}{4}\cos 2x$ d) $\frac{x}{4}\cos 2x$	Ans (c)	(CLO-3 Remember)
19.	The particular integral of $(D^2 + 2)y = x^2$ is	1 Mark	
	a) $\frac{1}{2}x^2$ b) $\frac{1}{2}(x^2-1)$ c) $\frac{1}{2}(x^2+1)$ d) $\frac{-1}{2}x^2$	Ans (b)	(CLO-3 Remember)
20.	The method of variation of parameters is used to find the particular integral of a second order differential equation whose _____ is known.	1 Mark	
	a) Complementary function b) constant c) variable d) degree	Ans (a)	(CLO-3 Remember)
21.	The order and degree of $\left(\frac{d^2y}{dx^2}\right)^2 + 3\frac{dy}{dx} + 2y = e^x$ are	1 Mark	
	a) 2, 1 b) 1, 2 c) 2, 2 d) 1, 1	Ans (c)	(CLO-3 Remember)
22.	The order and degree of $\left(\frac{d^2y}{dx^2}\right)^2 + 3\left(\frac{dy}{dx}\right)^4 + 2y = Sin2x$ are	1 Mark	
	a) 2, 1 b) 1, 2 c) 2, 2 d) 1, 1	Ans (c)	(CLO-3 Remember)
23.	The particular integral of $(D^3 - 1)y = 0$ is	1 Mark	
	a) 0 b) $Ae^x + B\cosh x$ c) $A\cos x + B\sin x$ d) $Ae^x + B\cosh x + C\sinh x$	Ans (a)	(CLO-3 Remember)
24.	The particular integral of $(D^2 + 2D + 1)y = 1$ is	1 Mark	
	a) 0 b) 5 c) 2 d) 1	Ans (d)	(CLO-3 Remember)
25.	The particular integral of $(D^2 + 2)y = x$ is	1 Mark	
	a) $\frac{1}{2}x$ b) $\frac{1}{2}(x^2-1)$ c) $\frac{1}{2}(x^2+1)$ d) $\frac{-1}{2}x^2$	Ans (a)	(CLO-3 Remember)

26.	The particular integral of $(D^2 + 4)y = \text{Cos } 2x$ is	1 Mark	
	a) $\frac{x}{2}\sin x$ b) $\frac{-x}{2}\sin x$ c) $\frac{-x}{4}\cos 2x$ d) $\frac{x}{4}\sin 2x$	Ans (d)	(CLO-3 Remember)
27.	The particular integral of $(D^2 + 1)y = \text{Cos } 2x$ is	1 Mark	
	a) $\frac{x}{2}\sin x$ b) $\frac{1}{5}\cos 2x$ c) $\frac{-x}{4}\cos 2x$ d) $\frac{x}{4}\sin 2x$	Ans (b)	(CLO-3 Remember)
28.	The complementary function of $\frac{d^2y}{dx^2}+8\frac{dy}{dx}+15y=0$	1 Mark	
	a) $C_1e^{-5x}+C_2e^{-3x}$ b) $C_1e^{4x}+C_2e^{4x}$ c) $C_1e^{5x}+C_2e^{3x}$ d) $C_1e^{2x}+C_2e^{6x}$	Ans (a)	(CLO-3 Remember)
29.	The complementary function of $(D^2 + 4)y = \sin x$ is	1 Mark	
	a) $C_1e^{-3x}+C_2e^{-3x}$ b) $C_1e^{3x}+C_2e^{3x}$ c) $C_1\cos 2x+C_2\sin 2x$ d) $(C_1+C_2x)e^{3x}$	Ans (c)	(CLO-3 Remember)
30.	The complementary function of $\frac{d^2y}{dx^2}-6\frac{dy}{dx}+9y=e^{4x}$	1 Mark	
	a) $C_1e^{-3x}+C_2e^{-3x}$ b) $C_1e^{3x}+C_2e^{3x}$ c) $(C_1+C_2x)e^{-3x}$ d) $(C_1+C_2x)e^{3x}$	Ans (d)	(CLO-3 Remember)
31.	The particular integral of $(D - 1)^2 y = e^{-x}$ is	1 Mark	
	a) $\frac{x}{32}e^{-4x}$ b) $\frac{x^2}{2}e^{x}$ c) $\frac{x}{16}e^{-4x}$ d) $\frac{1}{4}e^{-x}$	Ans (d)	(CLO-3 Remember)
32.	The particular integral of $(D - 3)^2y = 3^x$ is	1 Mark	
	a) $\frac{3^x}{(\log 3-3)^2}$ b) $\frac{2^x}{(\log 3-3)^2}$ c) $\frac{3^x}{(\log 2-2)^2}$ d) $\frac{2^x}{(\log 2-2)^2}$	Ans (a)	(CLO-3 Remember)
33.	The complementary function of $(D - 1)^2y = e^{-5x}$ is	1 Mark	
	a) $C_1e^{-x}+C_2e^{-x}$ b) $C_1e^{x}+C_2e^{x}$ c) $(C_1+C_2x)e^{x}$ d) $(C_1+C_2x)e^{-x}$	Ans (c)	(CLO-3 Remember)
34.	The particular integral of $(D + 1)^2 y = e^{-5x}$ is	1 Mark	

	a) $\frac{1}{16}e^{-5x}$ b) $\frac{x^2}{2}e^{x}$ c) $\frac{x}{36}e^{-5x}$ d) $\frac{1}{4}e^{-x}$	Ans (a)	(CLO-3 Remember)
35.	The particular integral of $(D^2 + 1)y = \cos x$ is	1 Mark	
	a) $\frac{x}{2}\sin x$ b) $\frac{-x}{3}\cos 2x$ c) $\frac{-x}{4}\cos 2x$ d) $\frac{x}{4}\sin 2x$	Ans (a)	(CLO-3 Remember)
36.	The particular integral of $(D^2 + 9)y = \sin 3x$ is	1 Mark	
	a) $\frac{x}{2}\sin x$ b) $\frac{-x}{6}\cos 3x$ c) $\frac{-x}{4}\cos 2x$ d) $\frac{x}{4}\sin 2x$	Ans (b)	(CLO-3 Remember)