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312301 – Applied Mathematics (Sem II)
As per MSBTE's K Scheme
CO / CM / IF / AI / AN / DS

Unit III		Differential Equation	Marks -12	
S. N.	MSBTE Board Asked Questions	Exam Year	Marks	
1.	Find the order and degree of $\frac{d^2y}{dx^2} = \sqrt{1 + \frac{dy}{dx}}$	S-14 S-19	3	
2.	Find the order and degree of $\frac{d^2y}{dx^2} = (y + \frac{dy}{dx})^{3/2}$	W-19 S-18 W-22	3 2	
3.	Find the order and degree of $\frac{d^2y}{dx^2} = \left[1 + \left(\frac{dy}{dx}\right)^2\right]^{3/2}$	S-22	3	
4.	Find the order and degree of $\frac{d^2y}{dx^2} = \sqrt[4]{y + \left(\frac{dy}{dx}\right)^2}$	S-19	3	
5.	Find the order and degree of $\frac{d^2y}{dx^2} = \sqrt[4]{1 + \left(\frac{dy}{dx}\right)^2}$	S-22	3	
6.	Find the order and degree of $\sqrt{\frac{d^2y}{dx^2} - \frac{dy}{dx} - xy^2} = 0$	S-11 W-19	3	
7.	Find order & the degree of the d.e. $\sqrt{\frac{dy}{dx}} = \sqrt[3]{\frac{d^2y}{dx^2}}$	S-10 S-12 S-23	3	
8.	Find order & the degree of the d.e. $\left(\frac{d^2y}{dx^2}\right)^{2/3} = \sqrt{y + \frac{dy}{dx}}$	S-23	3	
9.	Find the order and degree of $x^2 \frac{d^2y}{dx^2} + x \frac{dy}{dx} = my$	S-17	3	

10.	Find the order and degree of $\frac{d^2y}{dx^2} = 4\sqrt{1 + \left(\frac{dy}{dx}\right)^2}$	S-19	3
11.	Find order and degree of $\frac{d^2y}{dx^2} + \sqrt{1 + \frac{dy}{dx}} = 0$	W-08 S-15 S-22	3
12.	Find the order and degree of $\frac{d^2y}{dx^2} = \sqrt{y - \frac{dy}{dx}}$	W-13 S-23	3
13.	Form a D.E if $y = a \sin x + b \cos x$.	S-18	3
14.	Form a D.E if $y = A \sin x + B \cos x$.	W-18 S-22	3
15.	Form a D.E if $y = A \cos x + B \sin x$.	W-19	3
16.	Form a D.E if $y = Ae^x + Be^{-x}$.	S-19	3
17.	Form the d.e. by eliminating the arbitrary constants if $y = A \cos 3x + B \sin 3x$.	S-18 W-18 W-22 S-23	3
18.	Form a d.e. of $y = a \cos 4x + b \sin 4x$.	S-22	3
19.	Verify that $y = \log x$ is solution of $x \frac{d^2y}{dx^2} + \frac{dy}{dx} = 0$.	S-19 W-18	3
20.	Form the d.e. if, $y = A \cos(\log x) + B \sin(\log x)$.	W-19 S-18	3
21.	Form the differential equation by eliminating the arbitrary constants if $y^2 = 4ax$	W-18	3
22.	Show that $y = A \sin mx + B \cos mx$ is a solution of D.E $\frac{d^2y}{dx^2} + m^2y = 0$.	W-22	6
23.	Solve the d.e. $\frac{dy}{dx} = e^{2x-y} + x^2e^{-y}$.	S-19	3

24.	Solve: $e^{x+y} dx + e^{2y-x} = 0$.	W-18	3
25.	Solve: $(1+x^3) dy - x^2y dx = 0$	W-18	3
26.	Solve: $(1+x^2) dy - x^2y dx = 0$	W-19	3
27.	Solve the d.e. $(x + 1) \frac{dy}{dx} - y = e^x(x + 1)^2$	W-22	3
28.	Solve the d.e. $x(1 + y^2) dx + y(1 + x^2) dy = 0$.	S-18 W-19 W-22	3
29.	Solve the D.E. $x\sqrt{1 - y^2} dx + y\sqrt{1 - x^2} dy = 0$	S-22	3
30.	Solve the d.e. $\frac{dy}{dx} + y \tan x = \cos^2 x$.	S-19 S-18	3
31.	Solve the d.e. $\frac{dy}{dx} + y \cot x = \operatorname{cosec} x$.	S-19,	3
32.	Solve the d.e. $\frac{dy}{dx} + y \cot x = \cos x$.	W-18	3
33.	Solve the d.e. $x \frac{dy}{dx} - y = x^2$	S-18 S-22	3
34.	Solve the d.e. $x \frac{dy}{dx} + y = x^3$	W-19	3
35.	Solve: $x \log x \frac{dy}{dx} + y = 2 \log x$	W-19	3
36.	Solve the d.e. $\frac{dy}{dx} + \frac{y}{x} = x^2$	S-18	3
37.	Solve: $x^2y dx - (x^3 + y^3) dy = 0$	S-22	3

38.	Solve: $\sec^2 x \tan y dx + \sec^2 y \tan x dy = 0$	W-22	3
39.	Solve $(1 + x^2) dy - (1 + y^2) dx = 0$.	W-18	3
40.	Find integrating factor of D. E. $x \frac{dy}{dx} - y = x^2$	S-22	3
41.	Solve : $y^3 \sec^2 x dx + (3y^2 \tan x - \sec^2 y) dy = 0$	S-17	4
42.	Solve D.E. $(2xy + y^2) dx + (x^2 + 2xy + \sin y) dy = 0$	W-17 W-19 W-22	4
43.	Solve: $\left[y \left(1 + \frac{1}{x} \right) + \cos x \right] dx + [x + \log x - x \sin y] dy = 0$	S-18	4
44.	Solve: $(3x^2 + 6xy^2) dx + (6x^2 y + 4y^2) dy = 0$	W-18 S-19	4
45.	Solve: $(2x^2 + 6xy - y^2) dx + (3x^2 - 2xy + y^2) dy = 0$	S-22	4

Thank You

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