

D.K.M. COLLEGE FOR WOMEN (AUTONOMOUS), VELLORE-1
SEMESTER EXAMINATIONS
NOVEMBER – 2018
DIFFERENTIAL EQUATIONS

15CMA3A

Time : 3 Hrs

Max. Marks : 75

SECTION-A (10 x 2 = 20)**Answer ALL the questions.**

1. Write a Clairaut's equation.
2. Solve $p - \frac{1}{p} = \frac{x}{y} - \frac{y}{x}$ where $p = \frac{dy}{dx}$.
3. Define auxiliary equation for the function $\phi(D)y = b(x)$.
4. Solve $(D^2 - 4D + 4)y = 0$.
5. Find the particular integral of $(D^2 + 9)y = \sin 3x$
6. Solve $(x^2D^2 + 4xD + 2)y = 0$
7. Define Particular integral.
8. Write a Complete solution form in solving differential equation by using variation parameter method.
9. Solve $\frac{dx}{yz} = \frac{dy}{xz} = \frac{dz}{xy}$.
10. Write a standard form of simultaneous differential equation of the first order and first degree.

SECTION-B (5 x 5 = 25)**Answer any FIVE of the following questions.**

11. Solve $yp^2 + 2xp - y = 0$.
12. Solve $(D^2 - 4D + 3)y = x^3 e^{2x}$.
13. Solve $(D^2 - D + 1)y = x^3 - 3x^2 + 1$.
14. Solve $(x^2D^2 - 2xD - 4)y = x^2 + 2\log x$.
15. Solve $(x^2D^2 - 3xD + 5)y = x^2 \sin(\log x)$
16. Solve $\frac{d^2y}{dx^2} + y = \tan x$ v.
17. Solve $\frac{d^2y}{dx^2} - \frac{dy}{dx} = e^x \sin x$.
18. Solve $\frac{dx}{xy} = \frac{dy}{y^2} = \frac{dz}{x(yz - zx)}$.

SECTION-C (3 x 10 = 30)

Answer ALL the questions.

19. (a) Solve $p^2 + 2py \cot(x) = y^2$.

(Or)

(b) Solve $(D^2 + 1)y = x^2 \cos(x)$.

20. (a) Solve $(D^2 + 3D + 2)y = e^{2x} + x^2 + \sin(x)$.

(Or)

(b) Solve $(1+x)^2 \frac{d^2y}{dx^2} + (1+x) \frac{dy}{dx} + y = 2 \sin(\log(1+x))$.

21. (a) Solve $\frac{d^2y}{dx^2} + \frac{dy}{dx} = x \sin x$.

(Or)

(b) Solve the equation $2 \frac{dx}{dt} + x + \frac{dy}{dt} = \cos(t)$ and $\frac{dx}{dt} + 2 \frac{dy}{dt} + y = 0$.

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