

Reg. No.

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D.K.M. COLLEGE FOR WOMEN (AUTONOMOUS), VELLORE-1
SEMESTER EXAMINATIONS
NOVEMBER – 2017
DIFFERENTIAL EQUATIONS

15CMA3A

Time : 3 Hrs

Max. Marks : 75

SECTION-A (10 x 2 = 20)

Answer ALL questions.

1. Solve $y^2 = 1 + p^2$.
2. Solve $p^2 + pxy = y^2 \log y$.
3. Solve $y = p \sin p + \cos p$.
4. Solve $\frac{d^2y}{dx^2} - 3\frac{dy}{dx} + 2y = 0$.
5. Solve $(D^2 + 4)y = \sin 2x$.
6. Write a general linear non – homogenous equation of second order with variable coefficients.
7. Solve $(D^3 + D^2 + D + 1)y = 0$.
8. Solve $(xD^2 + D)y = 0$.
9. Find particular integral of $(D^2 + 2D + 2)y = e^{-x} \sin x$.
10. Solve $\frac{dx}{yz} = \frac{dy}{xz} = \frac{dz}{xy}$.

SECTION-B (5 x 5 = 25)

Answer any FIVE of the following questions.

11. Solve $xyp^2 + p(3x^2 - 2y^2) - 6xy = 0$.
12. Solve $y + px = p^2x^4$.
13. Solve $(D^2 + 6D + 5)y = 16e^{3x} + 7e^{-x} + 8$.
14. Solve $(D^3 + D^2 - D - 1)y = \cos 2x + 7$.
15. Solve $x^3 \frac{d^3y}{dx^3} + 3x^2 \frac{d^2y}{dx^2} + x \frac{dy}{dx} + y = x + \log x$.
16. Solve $y'' + y' = \sec x$ by the method of variation of parameters.
17. Solve $y'' + 3y' + 2y = 4e^{2x} + x$ by the method of undetermined coefficient.
18. Solve the simultaneous equations $\frac{dx}{dt} - y = t$, $\frac{dy}{dt} + x = t^2$.

SECTION-C (3 x 10 = 30)

Answer ALL questions.

19. (a) Solve $yp^2 + 2xp - y = 0$.

(Or)

(b) Solve $(x^2 + x)p^2 + (x^2 + x - 2xy - y)p + y^2 - xy = 0$.

20. (a) Solve $(D^3 - D^2 - 6D)y = 1 + x^2$.

(Or)

(b) Solve $x^2 \frac{d^2y}{dx^2} + 4x \frac{dy}{dx} + 2y = e^x$.

21. (a) Solve $(D + 2)x - 3y = t$.

(Or)

(b) Solve $y'' + a^2y = \tan ax$ by the method of variation of parameters.

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