B.Sc.DEGREE EXAMINATION,APRIL 2020
II Year III Semester
Differential Equations and Laplace Transforms

Time : 3 Hours **Max.marks :75**

Section A $(10 \times 2 = 20)$ Marks

Answer any **TEN** questions

1. Solve $y=(x-a)\,p-p^2$
2. Solve $x^2p^2+3xyp+2y^2=0$
3. Find the particular integral of $(D^2+D+1)y=x^2$
4. Solve $\frac{d^2y}{dx^2}+5\frac{dy}{dx}+4y=0$
5. Form a partial differential equation by eliminating the arbitrary constants a, b from $z=axy+b$.
6. Write down the Lagrange's equation.
7. Define the Laplace transform of a continuous function defined on the interval $(0,\infty)$
8. Find the Laplace transform of unit function.
9. Write down the Laplace transform of $sinh\ at$
10. Find the inverse Laplace transform of $\frac{2s+5}{s^2}$
11. Solve $\frac{d^2y}{dx^2}-4\frac{dy}{dx}+4y=0$
12. Find the complete integral of $q+cosp=0$

Section B $(5 \times 5 = 25)$ Marks

Answer any **FIVE** questions

13. Solve $xp^2-2yp+x=0$
14. Solve $\frac{d^2y}{dx^2}-y=2+5x$
15. Eliminate the arbitrary function f from $x+y+z=f(x^2+y^2+z^2)$ and form a partial differential equation.
16. Find $L\left[cos^2 2t\right]$
17. Solve $\frac{d^2y}{dt^2}+4\frac{dy}{dt}-5y=5$ given that $y=0$, $\frac{dy}{dt}=2$ at t = 0 using Laplace transform.

18. Solve $p^2+\left(x+y-\frac{2y}{x}\right)p+xy+\frac{y^2}{x^2}-y-\frac{y^2}{x}=0$
19. Find the complete integral of $p+q=x+y$

Section C $(3 \times 10 = 30)$ Marks

Answer any **THREE** questions

20. Solve $x=y^2+logp$
21. Solve $\left(D^2-4D+3\right)y=e^{-x}sinx$
22. Find the complete integral of $p^{-1}x+q^{-1}y=1$
23. Find $L^{-1}\left[\frac{s-3}{s^2+4s+13}\right]$
24. Solve the equation $\frac{d^2y}{dt^2}+2\frac{dy}{dt}-3y=sint$ given that $y=\frac{dy}{dt}=0$ when $t=0$ using Laplace Transform.

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