

SUDHARSAN COLLEGE OF ARTS AND SCIENCE
Perumanadu, Pudukottai-622 104.
Model Test - II – April– 2020
DIFFERENTIAL EQUATIONS AND LAPLACE
TRANSFORMS

Class : I B.Sc (Maths)

Sub Code:16SCCMM3

Time : 3 Hours

Marks : 75

Part – A

(10x2=20)

Answer All questions.

1. Solve : $p^2 - 5p + 6 = 0$.
2. Solve : $x^2 = (1 + p^2)$.
3. Solve : $(D^2 - 5D + 6)y = 0$.
4. Find the particular integral of $(D^2 + 5D + 6)y = e^x$
5. From a partial differential equation by eliminating a, b from $z = ax + by + a^2 + b^2$.
6. Solve $pq = 1$.
7. Solve : $(D^2 + DD' - 2D'^2)z = 0$.
8. Solve : $(D^2 + 3DD' + 2D'^2)z = x + y$.
9. Find $L[te^{-at}]$.
10. Find $L^{-1}\left[\frac{s^2-9}{(s^2+9)^2}\right]$.

Part – B

(5x5=25)

Answer any one choice given the each questions.

11. a) Solve : $x^2p^2 + xyp - 6y^2 = 0$
(or)
 b) Solve $x = y + a \log p$
12. a) Solve : $(D^2 - 4D + 3)y = \sin 3x \cos 2x$
(or)
 b) Solve : $(D^3 + 8)y = x^4 + 2x + 1$

13. a) Solve $(y + z)p + (z + x)q = x + y$

(or)

b) Solve $q = xp + p^2$

14. a) Solve $(D^2 - DD')z = \sin x \sin 2y$

(or)

b) Solve $(D^2 - DD' + D'^2)z = 2x + 3y$.

15. a) Find $L^{-1}\left[\frac{s+2}{(s^2+4s+5)^2}\right]$

(or)

b) Find $L^{-1}\left[\frac{s^2-s+2}{s(s-3)(s+2)}\right]$.

Part – C

(3x10=30)

Answer Any Three questions only.

16. Solve the equation $\frac{d^2y}{dx^2} + y = \sec x$ Using Method of variation of parameters
17. Solve : $(D^2 - 3D + 2)y = 540x^3e^{-x}$.
18. Solve by Charpit's method $pxy + pq + qy - yz = 0$.
19. Solve: $(D^2 - 3DD' + 2D'^2)z = e^{2x-y} + e^{x+y} + \cos(x + 2x)$
20. Solve : $\frac{d^2y}{dt^2} + 2\frac{dy}{dt} + 5y = 4e^{-t}$ given that $y = \frac{dy}{dt} = 0$, when $t=0$