ODEVC

UNIT I
1. Define differential equation
2. Define order and degree of differential equation
3. Define exact differential equation and give an example
4. Define liner and Bernoullis differential equation and give an examples
5. State newtons law of cooling ,natural growth and Decay
6. Define Integrating factor.
7. Find the Integrating factor of $(x^2 + y^2)$ dx- 2xydy= 0.
8. Define Orthogonal Trajectories.
9. Find the orthogonal trajectories of the family of curves $x^2 + y^2 = a^2$

Unit-2

1. Find the general solution of $y^{11} \square 4y^1 \square 13y \square 0$.

2.The Auxiliary equation of a D.E, f(m)= 0, has the roots $\square \square i\square$. Write the Complementary function of the related Differential equation.

3.solve the D.E $\frac{d^2y}{dx^2} - 5\frac{dy}{dx} + 7y = 0$

4. Find the Particular integral of $\square D^2 \square 9 \square y \square \cos 3x$ ——

5. Find the Particular integral of $\square D \square 1 \square^2 y \square e^{2x}$.

6. Find the complementary function of $\frac{d^3y}{dx^3} + 8y = 0$

7.Define Wronskian of the functions u(x), v(x), Also find the Wronskian of Sin ax,

Cos ax.

8. Find $\frac{1}{D}$(Sin3x)

9. Find the general solution of $y^{11} \square y^1 \square e^{\square x}$.

10. If m be the repeated root of Auxiliary equation k times, and n be non- repeated

root, then write the Complementary function of the D. E.

11. Write the real and imaginary parts of e^{imx} .

UNIT- 3

1. Define Laplace transformation.

2. Write the linearity property in Laplace transforms .

3. State First Shifting Theorem.

4. Find the Laplace transform of sin3t cos2t.

5. Find $L\{2\cos 5t - 3\sin 3t\}$.

6. State Convolution Theorem.

7. Define Unit step function and find its Laplace transform.

8. State Second Shifting theorem.

9. Write the Laplace transform of periodic function f(t) with period T

10. Find the Laplace transform of $e^{4t} \sin 2t$

UNIT-4

1. Define Gradient of a scalar point function.

2. Define Solenoidal vector.

3. If $\bar{r} = x\bar{\imath} + y\bar{\jmath} + z\bar{k}$ show that div $\bar{r} = 3$.

4. Find $\nabla(x^2 - yz + z^2)$.

5. Define Irrotational vector.

6. If $\bar{r} = x\bar{\imath} + y\bar{\jmath} + z\bar{k}$ show that curl $\bar{r} = 0$.

7. Find curl F when $F = 3x^2i + (2xz - y)j + zk$

8. Show that $f = (x + 3y)\bar{\imath} + (y - 3z)\bar{\jmath} + (x - 2z)\bar{k}$ is solenoidal.

9. Define directional derivative of the function

10. Find a unit normal vector to the given surface $x^2y + 2xz = 4$ at the point (2, -2, 3).

UNIT-5

1. Define line integral.

2. State Gauss Divergence theorem.

3. State Stoke's theorem.

4. Express the equation $x^2 + y^2 + z^2 = a^2$ in spherical polar coordinates

5. State Greens theorem.