MAT/MAS 1602   **Max : 75 Marks**

Calculus-II   **Time : 3 hrs.**

Answer any FIVE questions :- $5 \times 15 = 75$

1. Evaluate $\iiint xyz\, dxdydz$ taken through the positive octant of the sphere $x^2 + y^2 + z^2 = a^2$.

2. Solve $\dfrac{dy}{dx} = \dfrac{x+2y-3}{2x+y-3}$.

3. Solve $(D^2 - 4D + 3)y = \sin 3x \cos 2x$.

4. Solve: $\dfrac{d^2y}{dx^2} + y = \sec x$ by variation of parameters.

5. Solve $(x^2 - yz)p + (y^2 - zx)q = z^2 - xy$

6. Solve the equation $\dfrac{d^2y}{dt^2} + 2\dfrac{dy}{dt} - 3y = \sin t$ given that $y = \dfrac{dy}{dt} = 0$ when t=0 using Laplace transform.

7. Verify Stokes' theorem when F= (2x-y)i - yz^{2}j - y^{2}zk where S is the upper hemisphere of the unit sphere x^2+y^2+z^2= 1 and C is its boundary.

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