

LUKHDHIRJI ENGINEERING COLLEGE, MORBI

Subject: MATHEMATICS-1

Tutorial- 5

Sem-1

Branch: All

Multiple Integral

1. Evaluate $\int_0^1 \int_1^2 (x + y^2 + xy) dx dy$

2. Evaluate $\int_0^1 \int_0^{x^2} e^{y/x} dy dx$

3. Evaluate $\int_1^2 \int_x^{x^2} (x + y^2 + xy) dx dy$

4. By using polar co-ordinates, evaluate $\iint_R (x^2 + y^2) dA$, where R is the region bounded by

$$x^2 + y^2 = 1$$

5. Change the order of integration in the integral $\int_0^\infty \int_x^\infty \frac{e^{-y}}{y} dy dx$

6. Evaluate $\iint_R (x^2 + y^2) dA$, by changing the variable, where R is the region lying in the first quadrant and bounded by the hyperbolas $x^2 - y^2 = 1$, $x^2 - y^2 = 9$, $xy = 2$ and $xy = 4$.

7. Evaluate $\int_{-\pi/2}^{\pi/2} \int_0^{a \sin \theta} r^2 dr d\theta$

8. Evaluate $\int_0^1 \int_0^{2-x} \int_0^{2-x-y} dz dy dx$

9. Evaluate $\int_0^a \int_0^x \int_0^y xyz dz dy dx$

10. Evaluate $\int_0^1 \int_{x^2}^{2-x} xy dA$ by changing the order of integration.

11. Evaluate $\iiint_V 2x dV$; V is the solid region under the plane $2x + 3y + z = 6$ that lies in the first octant.

12. Evaluate $\int_0^a \int_0^{\sqrt{a^2 - y^2}} y^2 \sqrt{x^2 + y^2} dy dx$ by changing to polar coordinates.