

King Saud University
Department of Mathematics
M-203
(Differential and Integral Calculus)
Second Mid-Term Examination
(Summer-Semester 1435/1436)

Max. Marks: 25

Time: 90 Minutes

Marking Scheme: All questions carry equal marks

Q. No: 1 Reverse the order of integration, and evaluate the resulting integral

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

Q. No: 2 Use **polar coordinates** to evaluate the integral

$$\int_0^3 \int_0^{\sqrt{9-x^2}} (x^2 + y^2)^{3/2} dy dx.$$

Q. No: 3 Find the **surface area** of the surface S if S is the portion of the graph of $z = 2 + xy$ that lies inside the **cylinder** $x^2 + y^2 = 1$.

Q. No: 4 Find the volume of the solid bounded by the coordinated planes and the plane $x + y + z = 1$, using a triple integral.

Q. No: 5 Use cylindrical coordinates to evaluate the following integral:

$$\int_{-3}^3 \int_{-\sqrt{9-y^2}}^{\sqrt{9-y^2}} \int_{\sqrt{x^2+y^2}}^{12-x^2-y^2} dz dx dy.$$