

Department of Mathematics, College of Sciences
King Saud University, Riyadh.

M-203 (Differential and Integral Calculus)

2nd MidTerm Exam. (1st sem. 1447) (2025/2026),

Time: 90 Minutes

Max. Marks: 25.

Note: All questions carry equal marks.

Q1. Evaluate the double integral: $\int_1^e \int_{\frac{1}{e}}^{\frac{1}{y}} \cos(x - \ln(x)) dx dy$.

Q2. Evaluate the integral: $\iint_R \frac{x}{\sqrt{x^2 + y^2}} dA$, where R is the region that lies in the disc $x^2 + y^2 \leq 2y$ and $y \geq 1$.

Q3. Let S be the surface defined by $z = x^2 + y^2$ and over the upper half unit disc $x^2 + y^2 \leq 1$ and $y \geq 0$. Find the area of the surface S .

Q4. Find the volume of the region bounded the graphs of the equations: $z = 1 - y^2$, $z = 4 - y^2$, $y = -1$, $y = 1$, $x = 2$, and $x = 3$.

Q5. Evaluate the triple integral: $\iiint_Q \frac{3}{e + (x^2 + y^2 + z^2)^{\frac{3}{2}}} dV$,
where Q is the solid bounded above by the sphere $x^2 + y^2 + z^2 = 1$
and below by the cone $z = \sqrt{3x^2 + 3y^2}$.