

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

M-203 (Differential and Integral Calculus)

2nd MidTerm Examination (1st semester 1445) (2023/2024),

Time: 90 Minutes

Max. Marks: 25.

Note: All questions carry equal marks.

Q 1. Evaluate the double integral:

$$\int_0^6 \int_{\frac{y}{3}}^2 y\sqrt{1+x^3} dx dy.$$

Q 2. Use polar coordinates to evaluate the double integral:

$$\int_0^1 \int_0^{\sqrt{1-x^2}} \sin(x^2 + y^2) dy dx.$$

Q 3. Find the surface area of the portion of the paraboloid $z = 9 - x^2 - y^2$ that lies above the xy -plane.

Q 4. Evaluate the integral:

$$\int_0^1 \int_0^{\sqrt{1-y^2}} \int_1^2 3(x+y)z dz dx dy.$$

Q 5. Evaluate the integral by changing to cylindrical coordinates

$$\int_{-1}^1 \int_0^{\sqrt{1-x^2}} \int_0^{\sqrt{4-x^2-y^2}} z dz dy dx.$$