The Open University of Sri Lanka
B.Sc./B.Ed. Degree Programme – Level 04
No Book Test (NBT) – 2023/2024
Applied Mathematics
ADU4302- Vector Calculus
Duration : One Hour

Date : 19-08-2023 **Time : 2.30 p.m. – 3.30 p.m.**

Answer All Questions.

1. Find the surface integral of the function $f(x,y) = x + 2e^y - 3$, defined over the region $R = \{(x,\ y) | 0 \leq x \leq 1,\ 0 \leq y \leq 2\}$.

2. Find the surface integral of the function $f(x,y) = 3x^2 + y^2$ defined over the region bounded by $y^2 = 3 + x$ and $y = x - 3$.

3. Evaluate the surface integral of the function $f(x,y) = 4 - x^2 - y^2$ defined over the region bounded by circle of radius 2 with centre at the origin.

4. Evaluate the volume integral of the function $f(x,y,z) = xy + yz + zx$ defined over the region R where
$R = \{(x,y,z) / \ 0 \leq x \leq 1, -x^2 \leq y \leq x^2, 0 \leq z \leq 1\}$.

5. Find the volume of the region bunded by the cone $z = \sqrt{3(x^2 + y^2)}$ and the hemisphere $z = \sqrt{4 - x^2 - y^2}$.