

The Open University of Sri Lanka

B.Sc Degree Programme

No Book Test (NBT)- 2015/2016

Applied Mathematics - Level 04

APU2143/APE4143 – Vector Calculus

Duration :- One Hour



Date:- 15. 05. 2016

Time:- 10.30 a.m. - 11.30 a.m.

Answer All Questions.

1. (a) Find the surface integral of the function $f(x, y) = x^2 - 2xy + y^3$ over the region bounded by $x = 1$, $x = 3$, $y = 2$ and $y = 3$.

(b) Using surface integral, find the area of the region bounded by $y = x^2$ and $y = x + 2$.

(c) Using plane polar coordinates, evaluate the surface integral of the function $f(x, y) = x^2 + 2y^2$ over the region bounded by $1 \leq x^2 + y^2 \leq 2$, $x \geq 0$ and $y \geq 0$.

2. (a) Find the volume integral of the function $f(x, y, z) = 8xyz$ over the cuboid given by $0 \leq x \leq 1$, $0 \leq y \leq 2$ and $0 \leq z \leq 3$.

(b) Using Cylindrical polar coordinates, find the volume between sphere $x^2 + y^2 + z^2 = 1$ and the cone $z = \sqrt{x^2 + y^2}$.

(c) Using Spherical polar coordinates, find the volume of a sphere of radius a .