K.J. SOMAIYA COLLEGE OF ENGINEERING

TUTORIAL-9 VECTOR INTEGRATION

A1 batch

Q.1 Show that the velocity given by is irrotational and find its scalar

potential. Also find the work done in moving a particle from to

Q.2 Compute where and is the circle traversed counter clockwise.

Q.3 Green’s theorem for and is the triangle having vertices at

and

Q.4 Evaluate by Stoke’s Theorem for and is the boundary of the rectangle

A2 batch

Q.1 Evaluate where and is the portion of the curve

from to

Q.2 Verify Green’s Theorem for where is the rectangle whose vertices are

Q.3 Evaluate by Stoke’s Theorem where is the square in the plane with vertices

and

Q.4 If the vector field is irrotational find the constants where is given by

Show that can be expressed as the gradient of

scalar function. Then find the work done in moving a particle in this field from to along

the straight line joining these points.

A3 batch

Q.1 Prove that is irrotational and find scalar potential

function such that and . Also find the work done in moving a particle from

to

Q.2 Evaluate along the parabola from to What is the value of this integral if the path is the straight line joining and

Q.3 Verify Green’s theorem for where is the boundary of the region defined

by and

Q.4 Evaluate by Stoke’s Theorem for over the

paraboloid

A4 batch

Q.1 Find the work done in moving a particle in the force field from to

along the space curve

Q.2 Verify Green’s theorem for where is the boundry of the region defined by

and

Q.3 By using Stoke’s Theorem evaluate where is boundary of the region

enclosed by circles

Q.4 Show that is irrotational and find the scalar potential for

and evaluate along the curve joining the points and