SRM INSTITUTE OF SCIENCE AND TECHNOLOGY
DEPARTMENT OF MATHEMATICS
18MAB102T – ADVANCED CALCULUS AND COMPLEX ANALYSIS (2021 -2022 EVEN)

MODULE – 2 : VECTOR CALCULUS

TUTORIAL SHEET – III

S.No.	Questions	Answers
1	Verify Green's theorem in the XY plane $\int_C (xy+y^2)dx + x^2dy$, where C is the closed curve of the region bounded by $y = x$ and $y = x^2$.	
2	Verify Green's theorem in the plane for the integral $\int_C (x-2y)dx + xdy$, taken round the circle $x^2+y^2=1$.	
3	Evaluate the integral using Green's theorem $\int_C (2x^2-y^2)\,dx + (x^2+y^2)\,dy$ where C is the boundary in the XY plane of the area enclosed by the X axis and the semi-circle $x^2+y^2=1$ in the upper half XY plane.	$\frac{4}{3}$
4	Evaluate $\int_C xy\,dx + xy^2dy$ by Stoke's theorem where C is the square in XY plane with vertices $(1,0), (-1,0), (0,1)$ and $(0,-1)$.	
5	Verify Stoke's theorem for $\vec{F} = (x^2+y^2)\vec{i} - 2xy\vec{j}$ taken around the rectangle bounded by the lines $x = \pm 1, y = 0$ and $y = b$.	
6	Verify Stoke's theorem for $\vec{F} = y\vec{i} + z\vec{j} + x\vec{k}$ where S is the upper half surface of the sphere $x^2+y^2+z^2=1$ and C is its boundary.	
7	Verify Gauss divergence theorem for the function $\vec{F} = y\vec{i} + x\vec{j} + z^2\vec{k}$ over the cylindrical region bounded by $x^2+y^2=9, z=0$ and $z=2$.	
8	Verify the Gauss divergence theorem for $\vec{F} = 4xz\vec{i} - y^2\vec{j} + yz\vec{k}$ over the cube bounded by $x=0, x=1, y=0, y=1, z=0$ and $z=1$.	