Assignment Questions of
Mathematics - Paper - XIV
Semester - VI (B.Sc)

Vector Integration

1) If $\vec{F} = 3xy\vec{i} - y^2\vec{j}$, evaluate $\int_C F \cdot dr$, where C is the curve in the xy-plane, $y = 2x^2$ from (0,0) to (1,2).

(2) Evaluate $\iint \vec{F} \cdot \vec{n}\, ds$ where $F = yz\vec{i} + zx\vec{j} + xy\vec{k}$ and S is that part of the surface of the sphere $x^2 + y^2 + z^2 = 1$ which lies in the first octant.

(3) Verify divergence theorem for

$$F = (x^2 - yz)\vec{i} + (y^2 - zx)\vec{j} + (z^2 - xy)\vec{k}$$

taken over the rectangular parallelopiped $0 \le x \le a$, $0 \le y \le b$, $0 \le z \le c$.

Assignment Questions of Semester VI (B.Sc)
paper - Mathematics XIV
Sub - Vector - Space.

1) Define Vector Subspaces & prove that the necessary and sufficient Condition for a non empty subset W of a vector space V(F) to be a subspace of V is
$a, b \in F$ and $\alpha, \beta \in W \Rightarrow a\alpha + b\beta \in W$.

(2) prove that the Union of two subspaces is a subspace if and only if one is Contained in the other.

(3) prove that
the linear span $L(S)$ of any subset S of a vector space $V(F)$ is a subspace of V generated by S i.e
$$L(S) = \{S\}.$$