Department Of Mathematics
SYBSC (Semester IV) 19ScMatU403

Based on Vector Calculus

Subject : Mathematics Practical-IV (19ScMatU403)
Practical Incharge: Rima Ahuja
Practical 3:Divergence and Curl

1. Find $div\left(r^5\ \bar{r}\right)$.

2. Prove that $\nabla^2 \log r = \dfrac{1}{r^2}.$

3. Prove that $grad\left(div\dfrac{\bar{r}}{r}\right) = -2r^{-3}\bar{r}$.

4. If $\bar{f} = (xyz)^p\left(x^q\ \hat{i} + y^q\ \hat{j} + z^q\ \hat{k}\right)$ is irrotational and $p \neq 0$ then find q.

5. If $\bar{f} = (2xz^3 + 6y)\hat{i} + (6x - 2yz)\hat{j} + (3x^2z^2 - y^2)\hat{k}$ is conservative. Find corresponding scalar potential.