

[The page contains extremely faint and illegible text, likely a scan of a document with very low contrast or significant noise. The text is mostly obscured by horizontal lines and noise, making it impossible to read.]

17 Prove that the vector $(x^2 - yz)i + (y^2 - zx)j + (z^2 - xy)k$ is irrotational and find its scalar potential. [10] CO4 L3

OR

18 Find the directional derivative of the function $xy^2 + yz^2 + zx^2$ along the tangent to the curve $x = t, y = t^2, z = t^3$ at the point $(1,1,1)$. [10] CO4 L3

19 Evaluate the Line integral $\int_c [(x^2 + xy)dx + (x^2 + y^2)dy]$ where 'c' is the square formed by the lines $x = \pm 1$ and $y = \pm 1$. [10] CO5 L6

OR

20 Verify Stoke's theorem for $\vec{F} = yi + zj + xk$ and surface is the part of sphere $x^2 + y^2 + z^2 = 1$ above the xy-plane. [10] CO5 L4