Math 301-142 Quiz 1 (A)

Name:.....Sec#:.....ID#:.....Ser#:.....

Q.1: Find curl and divergence of the vector field $\overrightarrow{F}(x,y,z) = xye^x\hat{i} - x^3yze^z\hat{j} + xy^2e^y\hat{k}$.

Q.2: Find work done by the force $\overrightarrow{F}(x,y,z) = yz\hat{i} + xz\hat{j} + xy\hat{k}$ acting along the curve $\vec{r}(t) = t^3\hat{i} + t^2\hat{j} + t\hat{k}$ from $t = 1$ to $t = 2$.

Q.3: Determine whether the vector field $\overrightarrow{F}(x,y) = 2xy^3\hat{i} + 3y^2(x^2+1)\hat{j}$ is a conservative field. If so, find a potential function $\Phi(x,y)$ for $\overrightarrow{F}$ and evaluate $\int_{(0,1)}^{(1,2)} \overrightarrow{F} \cdot d\vec{r}$ using $\Phi(x,y)$.