

QUIZ 11

 (20MINS, 30PTS)

Please write down your name, SID, and solutions discernably.

Name :

SID :

Score :

1. (10pts) Evaluate the line integral.

$$\int_C xye^{yz} dy,$$

where $C : x = t, y = t^2, z = t^3, 0 \leq t \leq 1$.

2. (10pts) Evaluate the line integral $\int_C \mathbf{F} \cdot d\mathbf{r}$.

$$\mathbf{F}(x, y, z) = (x - y)\mathbf{i} + y^2\mathbf{j} + (z - x)\mathbf{k},$$

where C is given by the vector function $\mathbf{r}(t) = t^3\mathbf{i} - t^2\mathbf{j} + t\mathbf{k}, 0 \leq t \leq 1$.

3. (10pts) Find a function f such that $\mathbf{F} = \nabla f$ and use f to evaluate $\int_C \mathbf{F} \cdot d\mathbf{r}$ along the given curve C .

$$\mathbf{F}(x, y) = (1 + xy)e^{xy}\mathbf{i} + x^2e^{xy}\mathbf{j}, \quad C : \mathbf{r}(t) = \cos t\mathbf{i} + 2\sin t\mathbf{j}, \quad 0 \leq t \leq \frac{\pi}{2}$$