

ZCA 110 Calculus Test 3.

Venue: DPD; Date: Friday, 11 am- 12pm

9 Dec 2016

Name:

Matrix No:

Q1. Given that $u(x)$ is a differentiable function, explain how the following integration rule is

derived. [Hint: You may have to start from the differentiation of u^n]

$$\int u^n du = \frac{1}{n+1} u^{n+1} + C; n \neq -1.$$

Q2. Given $f(x) = \frac{\sin x + x \cos x}{\text{Exp}(x) + \text{Exp}(-x)}$, evaluate $\int_{-\pi}^{\pi} f(x) dx$.

Q3. Find the length of the curve parametrised by $x = 2t^2 + 1$, $y = 2t^3$, $0 \leq t \leq 1$.

Q4. Explain how the following differential result is derived: $\frac{d}{dx} e^x = e^x$.

Q5. Prove $\frac{e^{x_2}}{e^{x_1}} = e^{x_2} \cdot e^{-x_1}$, for all real numbers x_1 and x_2 .