Engineering Mathematics and Computing

Task 2: Coursework Assessment

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Git Repo : https://github.com/sakx7/mathcompuni2

Part A

Mathematics

A.1 Q1

1. Find $\int \frac{1}{7x+6}\,dx$

A.2 Q2

2. Find $\int \frac{x}{\sqrt{4-x^2}}\,dx$

A.3 Q3

3. Obtain the general solution of the equation $\frac{d^2y}{dx^2} - 18\frac{dy}{dx} + 81y = 0$

A.4 Q4

4. Find the particular solution of the differential equation $\frac{dy}{dx} + 3yx^3 = 0$, given $y(0) = 1$

A.5 Q5

5. If $z = \frac{11+10j}{9-3j}$, express both $\frac{1}{z}$ and $z + \frac{1}{z}$ in the standard form $\alpha + \beta j$

A.6 Q6

6. Obtain the general solution of $\frac{d^2y}{dx^2} - 2\frac{dy}{dx} - 48y = 5$

A.7 Q7

7. Find $\frac{\partial z}{\partial x}$ and $\frac{\partial z}{\partial y}$ when $z = xy^4e^{2x}$

A.8 Q8

8. Integrate the function $\int \frac{x+9}{x(x+5)}\,dx$

A.9 Q9

9. Solve the equation $\frac{dy}{dt} + y \cot t = 5 \sin t$

A.10 Q10

10. Evaluate the integral $\int_1^3 4xe^{4x}\,dx$