

SYLHET ENGINEERING COLLEGE
EEE 305 Term Test: 3

1 Evaluate

$$\int_0^3 (x^2 e^x) dx$$

Using multiple application of simpson's 1/3 rule with n=4

2 Evaluate question 1 using trapezoidal rule with n=4 4

3 Compute the backward difference approximation of $O(h)$ and $O(h^2)$ for the first derivative of $y = \sin x$ at $x = \frac{\pi}{4}$ using a value of $h = \frac{\pi}{12}$. Estimate the true percent relative error for each approximation. 3

4 Use the Gauss-Seidel method without relaxation to solve the following system to a tolerance of $\epsilon_a = 10\%$. 5

$$\begin{aligned} 3x_1 - 0.1x_2 - 0.2x_3 &= 7.85 \\ 0.1x_1 + 7x_2 - 0.3x_3 &= -19.3 \\ 0.3x_1 - 0.2x_2 + 10x_3 &= 71.4 \end{aligned}$$

Assume initial guesses to be 0 for $x_1, x_2,$ & x_3

5 Find the straight line fitting the points x_i and y_i 4

x_i	10	20	30	40	50	60	70	80
y_i	25	70	380	550	610	1220	830	1450

Total Time: 40 Minutes Total Mark: 20 Marks

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