



Dept. of Computer Engineering
Second Exam, Second Semester: 2014/2015

Course Title: Engineering Analysis II
Course No: (630262)

Date: 7/5/2015
Time Allowed: 50 minutes
No. of Pages: 1

NOTES: - Round ALL your calculations to 4 significant digits
- Angles for trigonometric functions are in radian scale

Please choose your section:

Instructor: Dr. Mohammed Mahdi Eng. Anis Nazer Eng. Sultan Al-Rushdan
Lecture time: 8:10 ح ث خ 11:10 ح ث خ 13:10 ح ث خ 11:15 ن ر

Question 1: (6 marks)

Consider the following data

x	1	1.5	2	2.1	2.6	3
y	3.5	2.1	1.1	1	0.5	0.25

Find the relation between x and y using data linearization for a function of the form $f(x) = C e^{Dx}$, then approximate y at x = 2.5

Question 2: (8 marks)

a) For the following data, find the second order Lagrange interpolating polynomial f(x) **in the simplest form** then approximate f(8) (5 marks)

x	2	4	6
f(x)	8	12	16

b) Approximate the integration using composite trapezoidal rule with 5 sampling points

(4 marks)

$$\int_1^2 \frac{1}{x(1+(\ln x)^2)}$$

Question 3:**(6 marks)**

Write the correct choice for the following questions

(1.5 marks each)

Part	1	2	3	4
Answer				

Consider the following data to answer parts (1) , (2)

x	1	2	3
y	1.5	2.2	3.9

1) Using 2nd order Newton interpolation, the value of b_2 is:

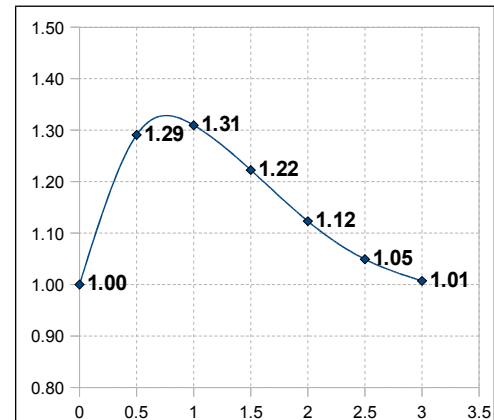
- a) 0 b) 0.5 c) 1.5 d) 2

2) Assume the relation is approximated using $f(x) = x + 0.5$, then SSE for this relation is:

- a) 0 b) 0.5 c) 0.25 d) 0.7

3) Refer to the figure to approximate $\int_{0.5}^{2.5} f(x) dx$ using composite trapezoidal with three sample points

- a) 2.445
 b) 2.565
 c) 2.390
 d) the integral cannot be approximated using trapezoidal rule

4) Using Lagrange interpolation for the points $(a, b), (c, d)$ then $L_1(x) =$

- a) $\frac{x-a}{c-a}$ b) $\frac{x-b}{b-a}$ c) $\frac{x-c}{c-a}$ d) $\frac{x-b}{c-b}$