Philadelphia University
Faculty of Engineering

Student Name:
Student Number

Dept. of Computer Engineering
Second Exam, First Semester: 2015/2016

Course Title: Engineering Analysis II	**Date: 10/1/2016**
Course No: (630262)	**Time Allowed: 50 minutes**

Please choose your section:

Instructor: ☐ **Eng. Anis Nazer** ☐ **Eng. Sultan Al-Rushdan**

Lecture time: ☐ **10:10 ح ث خ** ☐ **13:10 ح ث خ** ☐ **11:15 ن ر**

Question 1: **(5 marks)**

Write the third order Newton polynomial that passes through the following points and approximate *f(0)*

x_i	-1.2	0.5	1.5	2.3
y_i	8.82	1.85	5.85	13.37

Question 2: **(6 marks)**

Use nonlinear regression to find the exponential equation $y = C\,e^{Dx}$ that best fits the following points

x_i	1.2	1.3	1.5	1.7	1.75
y_i	14	15	19	25	26

Question 3: **(5 marks)**

Approximate the following integral using composite 1/3 Simpson's rule with 5 sampling points

$$\int_{1.2}^{2.8} \frac{x+1}{x\left(x-7\right)^2}\,dx$$

Question 4: **(4 marks)**

Choose the correct answer: (1 mark each)

Questions	Answer
1) What is the degree of the polynomial when performing interpolation with 4 points a) 4 b) 3 or less c) 3 or more d) 3	
2) Using 2nd order Lagrange interpolation on the points (-1,4), (-2,5), (-3,9) the resulting function is: f(x) = 9 A(x) + 4 B(x) + 5 C(x) . Then the function B(x) is: a) $\left(\frac{x+1}{-2+1}\right)\left(\frac{x+3}{-2+3}\right)$ b) $\left(\frac{x+1}{-3+1}\right)\left(\frac{x+2}{-3+2}\right)$ c) $\left(\frac{x+2}{-1-2}\right)\left(\frac{x+3}{-1-3}\right)$ d) $\left(\frac{x+2}{-1+2}\right)\left(\frac{x+3}{-1+3}\right)$	
3) Given the following data, find SSE for the function $f(x)=x^3+2x-1$ x_i: 1, 2, 3 — y_i: 2, 10, 30 a) 3 b) 1.291 c) 5 d) None of the choices	
4) In Composite trapezoidal rule, the error is **inversly proportional** to : a) number of points b) h c) f(x) d) None of the choices	

Good Luck