



COMSATS University Islamabad Islamabad Campus

Department of Computer Science
2nd SESSIONAL EXAMINATION - SPRING 2021
CSC475/MTH375-NUMERICAL COMPUTING

Total Marks: 15

Time Duration: 60 Minutes

Date: May 6, 2021

Time: 1330 - 1430

Registration #	
Name	
Section	

Read the following instructions carefully before attempting any of the questions:

1. Submit your solved part within allocated time. **Penalty in term of marks deduction** will be given for any late submissions.
2. All students must attend online scheduled exam within the allocated time slots.
3. Each student must ensure that cameras are turned on.
4. This examination is closed book, closed notes.
5. Attempt all questions. Marks are written adjacent to each question.
6. Write all steps, missing steps may lead to deduction of marks.
7. Paste the image for the tables, diagrams etc. while solving your questions.
8. Do not ask any questions about the contents of this examination from anyone.
 - a. If you think that there is something wrong with any of the questions, attempt it to the best of your understanding.
 - b. If you believe that some essential piece of information is missing, make an appropriate assumption and use it to solve the problem.

****WARNING: CUI takes serious action against unfair means. Anyone found involved in cheating will get an 'F' grade in this course.**

For Teacher's use only

Question	Question (CLO 4) Marks = 15					Total
	A	B	C	D	E	
Total Marks	3	3	3	3	3	15
Obtained Marks						

Question (CLO-4)

Consider the following data points

x	0	6	4	12	2	8	14	10
y	625	?	1	2401	81	?	?	625

- Find the missing entries in the above table.
- Find the values of a , b , and c , from above data (including missing values) such that $\Delta^3 y_a = \nabla^3 y_b = \delta^3 y_c = 786$
- A quadratic Lagrange interpolant $P(x)$ is found using three data points that you determine in part (a). Determine the coefficient of x^2 in $P(x)$.
- Determine the estimated regression equation $\hat{Y} = a + bx$ using above data points (including missing value that you find in part (a)). You can use following computation:
 $\Sigma x = 56, \Sigma y = 69426, \Sigma x^2 = 560, \Sigma xy = 954436, n = 8$
- Following polynomial $P(x)$ is determined using newton divided difference interpolation formula:

$$P(x) = \frac{5905}{64512}x^7 - \frac{5905}{1536}x^6 + \frac{147625}{2304}x^5 - \frac{206291}{384}x^4 + \frac{169805}{72}x^3 - \frac{40135}{8}x^2 + \frac{26025}{7}x + 625$$

Which equation i.e., above polynomial $P(x)$ or regression equation (obtained in part (d)) should you prefer for estimating the predicting value. Justify your answer?

ANSWER IN THIS BOX