



COLLEGE OF COMPUTING AND INFORMATION SCIENCES

Midterm Assessment Summer 2021 Semester

Class Id	107269	Course Title	Numerical Computing
Program	BSCS	Campus / Shift	Main Campus / Morning
Date	June 29, 2021	Total points	50
Duration	02 Hours	Faculty Name	Adnan Ullah Khan
Student Id		Student Name	

Instructions:

- Filling out Student-ID and Student-Name on exam header is mandatory.
- Do not remove or change any part of exam header or question paper.
- Write down your answers in given space or at the end of exam paper with proper title "Answer for Question# _ _".
- Answers should be formatted correctly (font size, alignment and etc)
- Handwritten text or image should be on A4 size page with clear visibility of contents.
- Only PDF format is accepted (Student are advise to install necessary software)
- In case of CHEATING, COPIED material or any unfair means would result in negative marking or ZERO.
- A mandatory recorded viva session will be conducted to ascertain the quality of answer scripts where deemed necessary.
- Naming convention should be SID-Name-CID. Ex: 50188-Kashif-106255.pdf.
- **Caution:** Duration to perform Midterm Assessment is **02 hours only**. **Therefore, if you failed to upload answer sheet on LMS (in PDF format) within 02 hours limit, you would be considered as ABSENT/FAILED.**

A : Last two digits of Students ID. for example if S.I.D 94564 then **A = 64**

$$2.A \ x = 2.64 \ x \quad \text{and} \quad 2 * A x = 2 * 64 x = 128 x$$

[Problem -1] [Points:10]

Solve the following set of equations by Gaussian elimination.

$$25x + 5y + A * z = 106.8$$

$$64x + 8y + z = 177.2$$

$$144x + 12y + z = 279.2$$

[Problem -2] [Points:10]

Solve the following system by LU decomposition method.

$$25x + 5y + A * z = 106.8$$

$$64x + 8y + z = 177.2$$

$$144x + 12y + z = 279.2$$

[Problem - 3] [Points :5, 5]

- a) Show that whether the function $f(x) = 4 \sin x + e^{-x} + 2.A$ has a root between 3.5 and 3.8. by Intermediate value theorem.
- b) The sum of two numbers is $2.A$, the square root of their product is $2*A$. What are the numbers? (Use any Numerical Tech.)

[Problem - 4] [Points :10]

A fourth- degree polynomial $f(x)$ has some positive roots,

$$f(x) = 4.A x^4 + 21.A x^3 - (135.A)x^2 - 8.A x - 85.0614$$

Use Newton's method $x_{i+1} = x_i - \frac{f(x_i)}{f'(x_i)}$ to find the root with the tolerance of 10^{-1} Starting with $x_0 = 2.A$. (Perform Maximum 4 Iteration)

[Problem -5] [Points :10]

When will the following method/algorithm fails?

- a) Bisection Method.
- b) Newton Method.
- c) Gauss Elimination Method.