B. Sc. in EEE
Summer semester

Date: July 2025

ISLAMIC UNIVERSITY OF TECHNOLOGY (IUT)
ORGANISATION OF ISLAMIC COOPERATION (OIC)
DEPARTMENT OF ELECTRICAL AND ELECTRONIC ENGINEERING

Lab Quiz - **02 (Set-F)**

Summer Semester - 2025

Course Number: EEE 4416

Full Marks: 20

Course Title: Simulation Lab

Time: 35 minutes

Question – 01

Write a script to check if the input string is a palindrome or not (case insensitive).

Test Case 1:

- Input: 'Tenet'
- Output: 1

Test Case 2:

- Input: 'Tenant'
- Output: 0

Test Case 3:

- Input: ‘aaaa’
- Output: 1

Test Case 4:

- Input: ‘aaaabbbbccc’
- Output: 0

Question – 02

Write a function termed **'is_cap'** that takes a string as input and returns a logical true or false based on whether each word starts with a capital letter or not.

Test case – 01

- Input: 'Kingdom of heaven'
- Output: 0

Test case – 02

- Input: 'SOS – Save Our Souls'
- Output: 1

Test case – 03

- Input: 'once upon a time'
- Output: 0

Test case – 04

- Input: 'We were, indeed, on a break'
- Output: 0

Test case – 05

- Input: 'Everything They Have Built Will Fall, And From The Ashes Of Their World, We Will Build A Better One.'
- Output: 1

Question – 03

Write a function called **'draw_F'** that takes an integer 'n' as input and returns an 'F' shaped square matrix of size. 'n' has to be > 4 and odd.

Test case – 01

- Input: 2
- Output: 'Input must be greater than 2 and an odd number'

Test case – 02

- Input: 5
- Output:

```
[1  1  1  1  1
 1  0  0  0  0
 1  1  1  1  0
 1  0  0  0  0
 1  0  0  0  0]
```

Test case – 03

- Input: 7
- Output:

```
[1  1  1  1  1  1  1
 1  0  0  0  0  0  0
 1  0  0  0  0  0  0
 1  1  1  1  1  1  0
 1  0  0  0  0  0  0
 1  0  0  0  0  0  0
 1  0  0  0  0  0  0]
```

Test case – 04

- Input: 220
- Output: 'Input must be greater than 2 and an odd number'

Question – 4

Create a function named **extract_checker_pattern** that takes a matrix A of size m × n and returns a new matrix B of the same size, where:

- All elements in the "checkerboard positions" (i.e., where the sum of row and column indices is even) are retained from A.
- All other elements (i.e., where (i + j) is odd) are replaced by 0.

Test Case 1:

Input :
A =
[1 2 3
4 5 6
7 8 9]
Output:
B =
[1 0 3
0 5 0
7 0 9]

Test Case 2:

Input:
A = [16 2 3 13
5 11 10 8
9 7 6 12
4 14 15 1]
Output:
B = [16 0 3 0
0 11 0 8
9 0 6 0
0 14 0 1]