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-J)** | Summer Semester - 2025

Course Number: EEE 4416 | Full Marks: 20

Course Title: Simulation Lab | Time: 35 minutes

Question – 01

- Create a matrix of random integers within the range [-50, 100] and size (6, 6).
- Create an array containing the maximum of each column.
- Create another array containing the minimum of each row.
- Stack the above two arrays vertically – the size should be (2, 6)
- Replace all the negative values with their absolute values in the original matrix. Replace all the positive values with 0.

Question – 02

Write a function called **'draw_C'** that takes an integer 'n' as input and returns a 'C' shaped square matrix of size. 'n' has to be > 3.

Test case – 01

- Input: 2
- Output: 'Input must be greater than 3

Test case – 02

- Input: 5
- Output:

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

Test case – 04

- Input: 20
- Output: … …

Question – 03

Write a function named **'twinprime'** that takes input n, where n ≥ 3, and returns an M×2 matrix whose rows are all twin-prime pairs [p, p+2] with both primes ≤ n. A twin prime pair **consists of two primes that differ by 2**.

Test case – 01

- Input: 2
- Output: [ ]

Test case – 02

- Input: 5
- Output: [3, 5]

Test case – 03

- Input: 20
- Output: [3 5;
  5 7;
  11 13;
  17 19]

Test case – 04

- Input: 30
- Output: [3 5;
  5 7;
  11 13;
  17 19]

Test case – 05

- Input: 100
- Output: [3 5; 5 7; 11 13; 17 19; 29 31; 41 43; 59 61; 71 73]

Question – 4

An emirp is a prime number that becomes a different prime when its digits are reversed. Write a function named **'isEmirp'** that checks whether the given input is an emirp or not.

- Input: integer n > 1
- Output: logical true/false

Test case – 01

- Input: 13
- Output: 1

Test case – 02

- Input: 11
- Output: 0

Test case – 03

- Input: 101
- Output: 0

Test case – 04

- Input: 107
- Output: 1