

ISLAMIC UNIVERSITY OF TECHNOLOGY (IUT)
ORGANISATION OF ISLAMIC COOPERATION (OIC)
Department of Computer Science and Engineering (CSE)

SEMESTER FINAL EXAMINATION

WINTER SEMESTER, 2020-2021

DURATION: 1 Hour 30 Minutes

FULL MARKS: 75

CSE 4105: Computing for Engineers

Answer all **three (3)** questions.

Figures in the right margin indicate marks along with COs and POs.

N.B. The name of the pdf must be in the following format <Student ID Course Code FINAL>

1. a) i. What makes a process random or stochastic? (4+4)
 ii. Describe some of the usage and application of probability in the real world and in the realm of computer science. (CO1)
- b) i. Suppose, you have 3 LED devices as shown below. Each of these can display any uniformly random digit between 0-9. What is the probability that the number formed by the 3 digits from the 3 devices is “189”? (6+5) (CO3)



Device 1



Device 2



Device 3

ii.

$$\text{If } 2X - Y = \begin{bmatrix} 3 & -3 & 0 \\ 3 & 3 & 2 \end{bmatrix} \text{ and } 2Y + X = \begin{bmatrix} 4 & 1 & 5 \\ -1 & 4 & -4 \end{bmatrix}$$

then find X and Y

- c) i. What sort of mathematical topics or concepts are studied in discrete mathematics? (3+3)
 ii. Why is the statement “X is a multiple of 5” where X is an integer – Not a propositional logic. (CO2)
2. a) i. What are the three kinds of transmission modes? Provide example for each of them. (6+4)
 ii. Explain the concept of Modulation. Why is it necessary for transmitting information? (CO1)
- b) i. Which layer in the OSI model organizes data into “frames”. Briefly state its function. (4+4)
 ii. TCP/IP is a communication protocol comprised of two parts. What are the functions of each of these two parts? (CO2)
- c) i. Internet Protocol (version 4) dictates that each device in a network should have a unique address. Briefly describe the format and number of bits in this address. (3+4) (CO3)
 ii. How is FTP different from HTTP?

3. a) i. Explain some of the advantages of a database approach over a file-based approach. (5+3)
ii. Draw a simple diagram of a 2-Tier client server database architecture. (CO2)
- b) i. How the traditional programming paradigm differs from machine learning. You may use a diagram to explain your answer. (3+3)
ii. What is the difference between supervised and unsupervised learning? (CO1)
- c) i. Briefly explain the following “Computer Vision” tasks and mention their applications - (9+2)
1. Image Classification, 2. Object Detection, 3. Semantic/Instance Segmentation (CO3)
ii. What is Human Computer Interaction or HCI? Explain briefly.