

University of Information Technology & Sciences (UITS)

Faculty of Science and Engineering

Department of Computer Science & Engineering

Program: B.Sc. in CSE

Mid Term Examination, Autumn 2025

Course Title: Discrete Mathematics

Course Code: CSE 0541123 / CSE 105

Marks: 20

Time: 1(one) hour

(Answer all questions)

- | Q.No. | Marks |
|--|-------|
| 1. a) Let $F(x, y)$ be the statement "x can fool y," where the domain consists of all people in the world. Use quantifiers to express each of these statements. | [06] |
| i. Everybody can fool Fred. | |
| ii. Everyone can fool everybody. | |
| iii. Everybody can fool somebody. | |
| b) Let p and q be the propositions where
p : You drive over 65 miles per hour.
q : You get a speeding ticket.
Write these propositions using p and q and logical connectives (including negations). | [04] |
| i. You do not drive over 65 miles per hour. | |
| ii. You drive over 65 miles per hour, but you do not get a speeding ticket. | |
| iii. You will get a speeding ticket if you drive over 65 miles per hour. | |
| iv. You do not get a speeding ticket, but you drive over 65 miles per hour. | |
| 2. a) Construct a truth table for the following compound proposition. | [04] |
| $\neg (p \wedge q \wedge r) = \neg p \vee \neg q \vee \neg r$ | |
| b) State the converse, contrapositive, and inverse of each of these conditional statements. | [06] |
| i. If it snows tonight, then I will stay at home. | |
| ii. I go to the beach whenever it is a sunny summer day. | |