

**Module 3: Logic**  
**CS 203: Discrete Structures**  
**Course Instructor : Prof. Prabuchandran K J**

**INSTRUCTIONS:** A student should consider the last two digits of his or her roll number. Divide it by 4. Take the remainder. Suppose the student gets  $i(0 \leq i \leq 3)$  as remainder. Then the student should answer  $(i + 1)^{th}$  numbered question. For example, if the last two digits are 20, the student should answer question number 1. Answer it in a paper, take a clear picture and submit your answer in jpg or pdf format in moodle. An event named logicMiniQuiz is created in moodle. Submit it there. The name of the jpg or pdf file should be your roll number. You are given 5 minutes to answer and 5 minutes to upload. If you face problem, you mail to Sagartanu-183061001@iitdh.ac.in first and then submit in moodle.

1. Using rules of inference, choose the correct option for statement  $q$ .

$p$  : If they were unsure of the address, they would have telephoned.

$q$  : ??

Therefore, they were sure of the address.

Options are:

(a) They have not telephoned.

(b) They have telephoned.

Justify your answer.

2. Consider the boolean expression corresponding to the statements:

$p$  : A number is divisible by 6.

$q$  : A number is divisible by 3.

$p \rightarrow q \equiv \neg q \rightarrow \neg p$

Is the boolean expression -

(a) right

(b) wrong

Justify your answer.

3. Consider the following two statements.

$p$  : A number is divisible by 5

$q$  : A number is divisible by 15.

Which of the following is true?

(a)  $p \rightarrow q$

(b)  $q \rightarrow p$

(c)  $p \leftrightarrow q$

(d)  $q \rightarrow \neg p$

Justify your answer.

4. What can we infer from the below statements?

If Rahul plays basketball in the afternoon, then he doesn't watch television in the evening.

Rahul watched television in the evening.

- (a) Rahul didn't play basketball in the afternoon.
- (b) Rahul played basketball in the afternoon.
- (c) Rahul did not watch television in the evening.
- (d) None of the above

Justify your answer.