

### Week 3

- 1) Let  $p$ : Ram likes ice cream or Sudha likes toffee

Negation of the statement  $p$  is?

- A. Ram does not like ice cream and Sudha does not like ice-cream
- B. Ram does not like ice cream or Sudha does not like ice-cream
- C. Ram does not like ice cream and Sudha likes ice-cream
- D. Ram does not like ice cream or Sudha likes ice-cream

**Correct Answer: A**

Solution: Check using truth table

Lecture 74: Negation Truth table

- 2) Which of the following statement(s) is/are true?

- I. The sentence, “**Rajesh is a hardworking man**” - is a statement
- II. 9 is not a prime number
- III. Cardinality of  $A \cup B$  is 5, where,  $A = \{1, 2, 3\}$   $B = \{2, 7, 8\}$

- A. I and III
- B. I II and III
- C. II and III
- D. Only II

**Correct Answer: C**

Solution: The statement I is false because it is opinion-based and not fact-based

Lecture 70:- Introduction to Statements

- 3) If  $A$  is any statement, then which of the following is a tautology?

- A.  $A \vee F$
- B.  $A \vee \neg A$
- C.  $A \wedge F$
- D.  $A \wedge T$

**Correct Answer: B**

Solution:  $A \vee \neg A$  is always true.

Lecture 95: Tautology, contradiction-part 1

4) “*It is not that I don't like travelling*”, said Reena, what does Reena mean?

- A. Reena likes travelling less frequently
- B. Reena does not likes travelling
- C. Reena likes travelling
- D. Reena does not likes travelling sometimes

**Correct Answer: C**

Solution: Not is used twice in the statement.

Lecture 75: Examples of negation

5)  $(p \rightarrow r) \vee (q \rightarrow r)$  is logically equivalent to

- A.  $(p \wedge q) \vee r$
- B.  $(p \vee q) \rightarrow r$
- C.  $(p \rightarrow q) \rightarrow r$
- D.  $(p \wedge q) \rightarrow r$

**Correct Answer: D**

Solution:  $((p \rightarrow r) \vee (q \rightarrow r)) \leftrightarrow ((p \wedge q) \rightarrow r)$  is tautology, use truthtable

Lecture 78: Truthtable for OR operator

6)  $(\neg p \vee q) \vee (\neg q \wedge \neg p)$  is equivalent to

- A.  $\neg q \wedge \neg p$
- B.  $\neg q \vee \neg p$
- C.  $\neg p \vee q$
- D.  $\neg q \vee \neg p$

**Correct Answer: C**

Solution: By truthtable

Lecture 93: XOR operator-part 3

- 7) If the truth value of **s** is True, where **s** is  $\neg((\neg q \wedge \neg p) \rightarrow p)$  then the truth value of p and q are respectively?

- A. F F
- B. T T
- C. T F
- D. F T

**Correct Answer: A**

Solution: By truthtable of implication and negation

Lecture 85: Examples of implication-part 1

- 8)  $\neg(p \vee q) \vee (\neg p \wedge \neg q)$  is logically equivalent to

- A.  $\neg p \wedge \neg q$
- B.  $\neg q$
- C.  $p \vee q$
- D.  $\neg p \wedge \neg q$

**Correct Answer: D**

Solution: By truthtable

Lecture 100: logical equivalence-part 1

9) What can we infer from the below statement?

$q$ : Gautam will go for a long drive to Mahabaleshwar or he will play cards

$r$ : Gautam did not go to Mahabaleshwar

- A. Gautam will not play cards
- B. Gautam will play cards
- C. Gautam maynot play cards
- D. None of the above

**Correct Answer: B**

Solution:  $((q^0 \vee r^1) \wedge (\neg q)^1) = r^1$ , hence  $((q \vee r) \wedge \neg q) = r$   
Lecture 114: rules of inferences part-5

10) If  $(\neg p \Rightarrow \neg q)$  is false then what is the truth value of p and q?

- A. T T
- B. T F
- C. F T
- D. F F

**Correct Answer: C**

Solution: By truthtable  
Lecture 74: Negation truthtable