

1. Which of the following sentence is a proposition?

- A. What is the height of Himalaya?
- B. Close the door
- C. How beautiful is Rose?
- D. New Delhi is the capital city of India

ANSWER: D

2. Propositions which do not contain any of the logical operators or connectives are called

- A. atomic propositions
- B. compound propositions
- C. conditional propositions
- D. biconditional propositions

ANSWER: A

3. A compound proposition $P = P(p_1, p_2, \dots, p_n)$ where p_1, p_2, \dots, p_n are variables is called a _____ if it is true for every truth assignment for p_1, p_2, \dots, p_n .

- A. contradiction
- B. tautology
- C. quantifiers
- D. tautological implication

ANSWER: B

4. The statement which contain one or more atomic statements and some connective are called _____

- A. atomic statement
- B. conditional statement
- C. biconditional statement
- D. molecular statements

ANSWER: D

5. A compound proposition $P = P(p_1, p_2, \dots, p_n)$ where p_1, p_2, \dots, p_n are variables is called a _____ if it is false for every truth assignment for p_1, p_2, \dots, p_n .

- A. tautology
- B. universal quantifier
- C. contradiction
- D. conditional propositions

ANSWER: C

6. The dual of $((P \vee Q) \wedge R) \vee T$ is

- A. $((P \vee Q) \vee R) \vee T$
- B. $((P \wedge Q) \vee R) \wedge T$
- C. $((P \wedge Q) \vee R) \wedge F$
- D. $((P \vee Q) \wedge R) \vee F$

ANSWER: C

7. A premise may be introduced at any point in the derivation is called _____

- A. Rule P
- B. Rule T
- C. Rule P and rule T
- D. Rule C

ANSWER: A

8. $p \rightarrow q$ is logically equivalent to

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

ANSWER: D

9. The contrapositive of $q \rightarrow p$ is

- A. $p \rightarrow q$
- B. $\neg p \rightarrow \neg q$
- C. $\neg q \rightarrow \neg p$
- D. $\neg p \rightarrow q$

ANSWER: B

10. The proposition $(p \vee q) \leftrightarrow (q \vee p)$ is a

- A. universal quantifier
- B. existential quantifier
- C. contradiction
- D. tautology

ANSWER: D

11. The symbolic form of the statement “Every book with a blue cover is a mathematics book” is

- A. $\exists x(B(x) \rightarrow M(x))$
- B. $\forall x(B(x) \rightarrow M(x))$
- C. $\forall x(B(x) \wedge M(x))$
- D. $\exists x(B(x) \wedge M(x))$

ANSWER: B

12. The set of premises is said to be _____ if their conjunction implies a contradiction

- A. tautology
- B. consistent
- C. inconsistent
- D. universe of discourse

ANSWER: C

13. The symbolic form of the following is “If Raja takes calculus or Anand takes analytical geometry then Arun will take English”

A. $(p \vee q) \rightarrow r$

B. $(p \vee q) \wedge r$

C. $p \vee (q \rightarrow r)$

D. $p \wedge (q \rightarrow r)$

ANSWER: A

14. When a quantifier is used on a variable x or when we have to assign a value to this variable to get a proposition, the occurrence of the variable is said to be _____

A. universal specification

B. existential specification

C. free variable

D. bound variable

ANSWER: D

15. The disjunctive syllogism rule is given by

A. $[(p \wedge q) \wedge \neg p] \rightarrow q$

B. $[(p \vee q) \wedge \neg p] \rightarrow q$

C. $[p \wedge (p \rightarrow q)] \rightarrow q$

D. $[\neg q \wedge (p \rightarrow q)] \rightarrow \neg p$

ANSWER: B

16. $P \vee F$ is equivalent to

A. P

B. T

C. F

D. $\forall x P(x)$

ANSWER: A

17. $\neg \exists x P(x)$ is equivalent to

A. $\exists x P(x)$

B. $\forall x P(x)$

C. $\forall x \neg P(x)$

D. $\exists x \neg P(x)$

ANSWER: C

18. The modus ponens rule is

A. $[\neg p \wedge (p \rightarrow q)] \rightarrow q$

B. $[p \wedge (p \rightarrow q)] \rightarrow q$

C. $[p \wedge (\neg p \rightarrow q)] \rightarrow q$

D. $[p \wedge (p \rightarrow \neg q)] \rightarrow q$

ANSWER: B