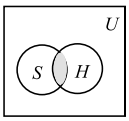
SESSION : 2025-26

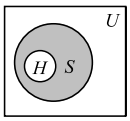
DPP
DAILY PRACTICE PROBLEMS

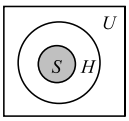
CLASS : XIth **SUBJECT : MATHS**
DATE : **DPP NO. :1**

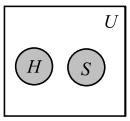
Topic :-MATHEMATICAL REASONING

1. H:Set of holiday, S: Set of Sunday and U:Set of day's
Then, the Venn diagram of statement, 'Every Sunday implies holiday' is

a) 

b) 

c) 

d) 

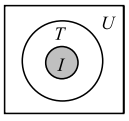
2. Simplify $(p \vee q) \wedge (p \vee \sim q)$
a) p b) T c) F d) q

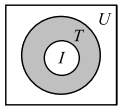
3. The statement $p \Rightarrow p \vee q$ is
a) A tautology
b) A contradiction
c) Both a tautology and contradiction
d) Neither a tautology nor a contradiction

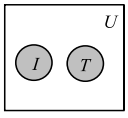
4. $p \rightarrow q$is logically equivalent to
a) $p \wedge \sim q$ b) $\sim p \rightarrow \sim q$ c) $\sim q \rightarrow \sim p$ d) None of these

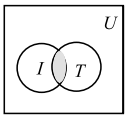
5. Which of the following is logically equivalent to $p \wedge q$?
a) $p \rightarrow \sim q$ b) $\sim p \vee \sim q$ c) $\sim (p \rightarrow \sim q)$ d) $\sim (\sim p \wedge \sim q)$

6. Some triangles are not isosceles. Identify the Venn diagram

a) 

b) 

c) 

d) 

7. Which of the following is contingency?
a) $p \vee \sim p$ b) $p \wedge q \Rightarrow p \vee q$ c) $p \wedge \sim q$ d) None of these

8. $\sim (p \vee q) \vee (\sim p \wedge q)$is logically equivalent to
a) $\sim p$ b) p c) q d) $\sim q$

9. A compound sentence formed by two simple statements p and q using connective 'or' is called
a) Conjunction b) Disjunction c) Implication d) None of these

10. If p and q are two statements, then $p \vee \sim (p \Rightarrow \sim q)$ is equivalent to
    a) $p \wedge \sim q$ b) p c) q d) $\sim p \wedge q$

11. Let $p \wedge (q \vee r) = (p \wedge q) \vee (p \wedge r)$. Then, this law is known as
    a) Commutative law b) Associative law c) De-Morgan's law d) Distributive law

12. If p and q are two statements, then statement $p \Rightarrow q \wedge \sim q$ is
    a) Tautology b) Contradiction
    c) Neither tautology not contradiction d) None of the above

13. Which of the following is logically equivalent to $\sim(\sim p \rightarrow q)$?
    a) $p \wedge q$ b) $p \wedge \sim q$ c) $\sim p \wedge q$ d) $\sim p \wedge \sim q$

14. The statement $(p \Rightarrow q) \Leftrightarrow (\sim p \wedge q)$ is a
    a) Tautology b) Contradiction c) Neither (a) nor (b) d) None of these

15. A compound sentence formed by two simple statements p and q using connective 'and' is called
    a) Conjunction b) Disjunction c) Implication d) None of these

16. Let p: is not greater than and q: Pairs is in France Be two statements. Then, $\sim(p \vee q)$ is the statement
    a) 7 is greater than or Pairs is not in France
    b) 7 is not greater than 4 and Pairs is not in France
    c) 7 is greater than 4 and Pairs is in France
    d) 7 is greater than 4 and Pairs is not in France

17. If p and q are two simple propositions, then $p \leftrightarrow \sim q$ is true when
    a) $p$and$q$ both are true
    b) Both p and q are false
    c) p is false and q is true
    d) None of these

18. Negation of "Pairs is in France and Londan is in England" is
    a) Pairs is in England and Londan is in France
    b) Pairs is not in France or Londan is not in England
    c) Pairs is in England or Londan is in France
    d) None of the above

19. If truth value of $p \vee q$ is true, then truth value of $\sim p \wedge q$ is
    a) False if p is true b) True if p is true c) False if q is true d) True if q is true

20. The logically equivalent proposition of $p \Leftrightarrow q$ is
    a) $(p \wedge q) \vee (p \wedge q)$ b) $(p \Rightarrow q) \wedge (q \Rightarrow p)$ c) $(p \wedge q) \vee (q \Rightarrow p)$ d) $(p \wedge q) \Rightarrow (p \vee q)$

SESSION : 2025-26

DPP
DAILY PRACTICE PROBLEMS

CLASS : XIth **SUBJECT : MATHS**
DATE : **DPP NO. :2**

Topic :-MATHEMATICAL REASONING

1. Which of the following connectives satisfy commutative law?
   a) $\wedge$ b) $\vee$ c) $\Leftrightarrow$ d) All the above

2. Which of the following propositions is a contradiction?
   a) $(\sim p \vee \sim q) \vee (p \vee \sim q)$ b) $(p \rightarrow q) \vee (p \wedge \sim q)$ c) $(\sim p \wedge q) \wedge (\sim q)$
   d) $(\sim p \wedge q) \vee (\sim q)$

3. Let p be the proposition Mathematics is interesting and let q be the proposition that Mathematics is difficult, then the symbol $p \wedge q$ means
   a) Mathematics is interesting implies that Mathematics is difficult
   b) Mathematics is interesting implies and is implied by Mathematics is difficult
   c) Mathematics is intersecting and Mathematics is difficult
   d) Mathematics is intersecting or Mathematics is difficult

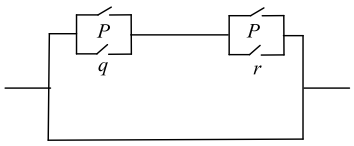
4. If $(p \wedge \sim r) \rightarrow (\sim p \vee q)$ is false, then the truth values of p, q and r are respectively
   a) T, F and F b) F, F and T c) F, T and T d) T, F and T

5. If statements p and r are false and q is true, then truth value of $\sim p \Rightarrow (q \wedge r) \vee r$ is
   a) T b) F c) Either T or F d) Neither T nor F

6. Let p and q be two statements, then $(p \vee q) \vee \sim p$ is
   a) Tautology b) Contradiction c) Both (a) and (b) d) None of these

7. the contrapositive of "If two triangles are identical, then these are similar" is
   a) If two triangles are not similar, then these are not identical
   b) If two triangles are not identical, then these are not similar
   c) If two triangles are not identical, then these are similar
   d) if two triangles are not similar, then these are identical

8. Simplify the following circuit and find the boolean polynomial.



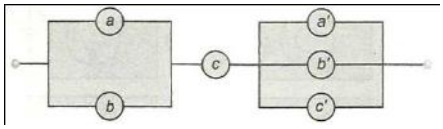
   a) $p \vee (q \wedge r)$ b) $p \wedge (q \vee r)$ c) $p \vee (q \vee r)$ d) $p \wedge (q \wedge r)$

9. Which of the following statement is a tautology
   a) $(\sim q \wedge p) \wedge q$ b) $(\sim q \wedge p) \wedge (p \wedge \sim p)$ c) $(\sim q \wedge p) \vee (p \wedge \sim p)$ d) $(p \wedge q) \wedge (\sim (p \wedge q))$

10. The negation of the proposition "If 2 is prime, then 3 is odd" is
   a) If 2 is not prime, then 3 is not odd
   b) 2 is prime and 3 is not odd
   c) 2 is not prime and 3 is odd
   d) If 2 is not prime, then 3 is odd

11. If $p, q,$ and r are simple propositions with truth values T,F,T, then the truth value of $(\sim p \vee q) \wedge\wedge \sim q \rightarrow p$ is
   a) True b) False c) True, if r is false d) None of these

12. Switching function of the network is



   a) $(a \wedge b) \vee c \vee (a' \wedge b' \wedge c')$ b) $(a \wedge b) \vee c \vee (a' \wedge b' \wedge c)$
   c) $(a \vee b) \wedge c \wedge (a' \vee b' \vee c')$ d) None of the above

13. The negation of the proposition $q \vee \sim (p \wedge r)$ is
   a) $\sim q \vee (p \wedge r)$ b) $\sim q \wedge (p \wedge r)$ c) $\sim p \vee \sim q \vee \sim r$ d) None of these

14. Which of the following pairs are logically equivalent?
   a) Conditional, Contrapositive
   b) Conditional, Inverse
   c) Contrapositive, Converse
   d) Inverse, Contrapositive

15. The statement $(\sim p \wedge q) \vee \sim q$ is
   a) $p \vee q$ b) $p \wedge q$ c) $\sim (p \vee q)$ d) $\sim (p \wedge q)$

16. $\sim[(p \wedge q) \rightarrow (\sim p \vee q)]$is
   a) Tautology b) Contradiction c) neither (a) nor (b) d) either (a) or (b)

17. If $p \rightarrow (q \vee r)$ is false, then the truth values of p, q, r are respectively
   a) F, T, T b) T, T, F c) T, F, F d) F, F, F

18. Let R be the set of real numbers and $x \in R$. Then, $x + 3 = 8$ is
   a) Open statement b) A true statement c) False statement d) None of these

19. Which of the following not a statement in logic?
1. Earth is planet.
2. Plants are living objects.
3. $\sqrt{-3}$is a rational number.
4. $x^2 - 5x + 6 < 0$, when $x \in -R$.
   a) 1 b) 3 c) 2 d) 4

20. Dual of $(x \wedge y) \vee (x \wedge 1) = x \wedge x \vee y \wedge y$ is

a) $(x \vee y) \wedge (x \vee 0) = x \vee (x \wedge y) \vee y$

b) $(x \wedge y) \wedge (x \vee 1) = x \vee (x \wedge y) \vee y$

c) $(x \vee y) \vee (x \vee 0) = x \vee (x \wedge y) \vee y$

d) None of the above

SESSION : 2025-26

DPP
DAILY PRACTICE PROBLEMS

CLASS : XIth **SUBJECT : MATHS**
DATE : **DPP NO. :3**

Topic :-MATHEMATICAL REASONING

1. The contrapositive of $(\sim p \wedge q) \rightarrow \sim r$ is
   a) $(p \wedge q) \rightarrow r$ b) $(p \vee q) \rightarrow r$ c) $r \rightarrow (p \vee \sim q)$ d) None of these

2. $\sim p \wedge q$is logically equivalent to
   a) $p \rightarrow q$ b) $q \rightarrow p$ c) $\sim(p \rightarrow q)$ d) $\sim(q \rightarrow p)$

3. $p \wedge (q \wedge r)$is logically equivalent to
   a) $p \vee (q \wedge r)$ b) $(p \wedge q) \wedge r$ c) $(p \vee q) \vee r$ d) $p \rightarrow (q \wedge r)$

4. If $p =$ He is intelligent
$q =$He is strong
Then, symbolic form of statement
"It is wrong that he is intelligent or strong," is
   a) $\sim p \vee \sim p$ b) $\sim (p \wedge q)$ c) $\sim (p \vee q)$ d) $p \vee \sim q$

5. Which of the following is a contradiction?
   a) $(p \wedge q) \wedge (\sim (p \vee q))$ b) $p \vee (\sim p \wedge q)$ c) $(p \rightarrow q) \rightarrow p$ d) None of these

6. The statement $p \vee q$ is
   a) A tautology b) A contradiction c) Contingency d) None of these

7. When does the value of the statement $p(\wedge r) \Leftrightarrow (r \wedge q)$ become false?
   a) $p$is$T$, q is F b) p is, r is F c) p is F, q is $F$and r is F d) None of these

8. $(p \wedge \sim q) \wedge (\sim p \wedge q)$is
   a) a tautology b) a contradiction c) tautology and contradiction d) neither a tautology not a contradiction

9. If p always speaks against q, then $p \Rightarrow p \vee \sim q$ is
   a) A tautology b) Contradiction c) Contingency d) None of these

10. If p, q, r have truth values T, F, T respectively, which of the following is true?
   a) $(p \rightarrow q) \wedge r$ b) $(p \rightarrow q) \wedge \sim r$ c) $(p \wedge q) \wedge (p \vee r)$ d) $q \rightarrow (p \wedge r)$

11. Dual of $(x' \vee y')' = x \wedge y$ is
    a) $(x' \vee y') = x \vee y$ b) $(x' \wedge y')' = x \vee y$ c) $(x' \wedge y')' = x \wedge y$ d) None of the above

12. $p \vee q$ is true when
    a) Both p and q are true b) p is true and q is false c) p is false and q is true
    d) All of these

13. Which of the following propositions is a tautology?
    a) $(\sim p \vee \sim q) \vee (p \vee \sim q)$
    b) $(\sim p \vee \sim q) \wedge (p \vee \sim q)$
    c) $\sim p \wedge (\sim p \vee \sim q)$
    d) $\sim q \wedge (\sim p \vee \sim q)$

14. For any two statements $p$and q, $\sim(p \vee q) \vee (\sim p \wedge q)$is logically equivalent to
    a) p b) $\sim p$ c) q d) $\sim q$

15. Identify the false statement
    a) $\sim[p \vee (\sim q)] \equiv (\sim p) \wedge q$ b) $[p \vee q] \vee (\sim p)$ is a tautology
    c) $[p \wedge q] \wedge (\sim p)$is a contradiction d) $\sim(p \vee q) \equiv (\sim p) \vee (\sim q)$

16. $\sim[p \leftrightarrow q]$is
    a) Tautology b) Contradiction c) neither (a) nor (b) d) either (a) or (b)

17. Let truth values of p be F and $q$be T. Then, truth value of $\sim (\sim p \vee q)$ is
    a) T b) F c) Either T or F d) Neither T nor F

18. Which of the following statements is a tautology?
    a) $(\sim q \wedge p) \wedge q$ b) $(\sim q \wedge p) \wedge (p \wedge \sim p)$ c) $(\sim q \wedge p) \vee (p \vee \sim p)$ d) $(p \wedge q) \wedge (\sim(p \wedge q))$

19. Consider the proposition : "If we control population growth, we prosper". Negative of this proposition is
    a) If we do not control population growth, we prosper
    b) If we control population, we do not prosper
    c) We control population but we do not prosper
    d) We do not control population but we prosper

20. Which of the following is not a proposition?
    a) 3 is prime b) $\sqrt{2}$ is irrational
    c) Mathematics is interesting d) 5 is an even integer

SESSION : 2025-26

DPP
DAILY PRACTICE PROBLEMS

CLASS : XIth **SUBJECT : MATHS**
DATE : **DPP NO. :4**

Topic :-MATHEMATICAL REASONING

1. If p and q are two statements, then $(p \Rightarrow q) \Leftrightarrow (\sim q \Rightarrow \sim p)$ is a
   a) Contradiction b) Tautology c) Neither (a) nor (b) d) None of these

2. The logically equivalent proposition of $p \rightarrow q$ is
   a) $(p \rightarrow q) \vee (q \rightarrow p)$ b) $(p \vee q) \rightarrow (p \vee q)$ c) $(p \wedge q) \wedge (p \vee q)$ d) $(p \rightarrow q) \wedge (q \rightarrow p)$

3. If p and q are statements, then $\sim (p \wedge q) \vee \sim (q \Leftrightarrow p)$ is
   a) Tautology b) Contradiction
   c) Neither tautology nor contradiction d) Either tautology or contradiction

4. Consider the proposition : " If the pressure increases, the volume decreases:. The negation of this proposition is
   a) If the pressure does not increase the volume does not decrease
   b) If the volume increases, the pressure decreases
   c) If the volume does not decreases, the pressure does not increase
   d) If the volume decreases, then the pressure does not increase

5. The dual of the statement $[p \vee (\sim q)] \wedge (\sim p)$ is
   a) $p \vee (\sim q) \vee \sim p$ b) $(p \wedge \sim q) \vee \sim p$ c) $p \wedge \sim (q \vee \sim p)$ d) None of these

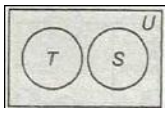
6. Which of the following is logically equivalent to $(p \wedge q)$?
   a) $p \rightarrow q$ b) $\sim p \wedge \sim q$ c) $p \wedge \sim q$ d) $\sim (p \rightarrow \sim q)$

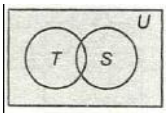
7. The proposition $p \rightarrow \sim (p \wedge \sim q)$ is
   a) A contradiction
   b) A tautology
   c) Either a tautology or a contradiction
   d) Neither a tautology nor a contradiction

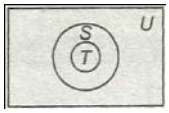
8. Which of the following statement has the truth value 'F'?
   a) A quadratic equation has always a real root
   b) The number of ways of seating 2 persons in two chairs out of n persons is $P(n, 2)$
   c) The cube roots of unity are in GP
   d) None of the above

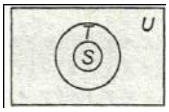
9. The negative of the proposition : "If a number is divisible by 15, then it is divisible by 5 or 3"
   a) If a number is divisible by 15, then it is not divisible by 5 and 3
   b) A number is divisible by 15 and it is not divisible by 5 and 3
   c) A number is divisible by 15 and it is not divisible by 5 or 3
   d) A number is not divisible by 15 or it is not divisible by 5 and 3

10. $p \wedge q \rightarrow p$is
   a) A tautology
   b) A contradiction
   c) Neither a tautology $n$or a contradiction
   d) None of these

11. All teachers are scholar, Identify the Venn diagram
   a) 

   b) 

   c) 

   d) 

12. the negation of the statement "he is rich and happy" is given by
   a) he is not rich and not happy
   b) he is not rich or not happy
   c) he is rich and happy
   d) he is not rich and happy

13. The property $\sim (p \wedge q) \equiv \sim p \vee \sim q$ is called
   a) Associative law
   b) De morgan's law
   c) Commutative law
   d) Idempotent law

14. The negation of the compound proposition $p \vee (\sim p \vee q)$ is
   a) $(p \wedge \sim q) \wedge \sim p$
   b) $(p \wedge \sim q) \vee \sim p$
   c) $(p \wedge \sim q) \vee \sim p$
   d) None of these

15. The negation of $q \vee \sim (p \wedge r)$ is
   a) $\sim q \vee \sim (p \wedge r)$
   b) $\sim q \vee (p \wedge r)$
   c) $\sim q \wedge (p \wedge r)$
   d) $\sim q \wedge \sim (p \wedge r)$

16. $\sim(\sim p) \leftrightarrow p$is
   a) A tautology
   b) A contradiction
   c) Neither a contradiction nor a tautology
   d) None of these

17. The contrapositive of $2x + 3 = 9 \Rightarrow x \neq 4$ is
   a) $x = 4 \Rightarrow 2x + 3 \neq 9$
   b) $x = 4 \Rightarrow 2x + 3 = 9$
   c) $x \neq 4 \Rightarrow 2x + 3 \neq 9$
   d) $x \neq 4 \Rightarrow 2x + 3 = 9$

18. Negation of the conditional, "If it rains, I shall go to school" is
   a) It rains and I shall go to school
   b) It rains and I shall not go to school
   c) It does not rains and I shall go to school
   d) None of the above

19. If a compound statement r is contradiction, then the truth value of $(p \Rightarrow q) \wedge r \wedge p[p \Rightarrow \sim r]$ is
   a) TM
   b) F
   c) T or F
   d) None of these

20. The statement $p \vee \sim p$ is

a) Tautology
b) Contradiction
c) Neither a tautology nor a contradiction
d) None of the above

SESSION : 2025-26

DPP
DAILY PRACTICE PROBLEMS

CLASS : XIth **SUBJECT : MATHS**
DATE : **DPP NO. :5**

Topic :-MATHEMATICAL REASONING

1. If $p \to (q \vee r)$ is false, then the truth values of p, q, r are respectively
   a) T, T, T b) F, T, T c) F, F, F d) T, F, F

2. If p: Ram is smart
q: Ram is intelligent
Then, the symbolic form Ram is smart and intelligent, is
   a) $(p \wedge q)$ b) $(p \vee q)$ c) $(p \wedge \sim q)$ d) $(p \vee \sim q)$

3. Which of the following is not a proposition?
   a) $\sqrt{3}$is a prime b) $\sqrt{2}$ is irrational
   c) Mathematics is interesting d) 5 is an even integer

4. $\sim [\sim p \wedge (p \Leftrightarrow q)] \equiv$
   a) $p \vee q$ b) $q \wedge p$ c) T d) F

5. Which of the following is equivalent to$p \Rightarrow q$?
   a) $p \Rightarrow q$ b) $q \Rightarrow p$ c) $(p \Rightarrow q) \wedge (q \Rightarrow p)$ d) None of these

6. Let p and q be two propositions. Then the inverse of the implication $p \to q$ is
   a) $q \to p$ b) $\sim p \to \sim q$ c) $p \to q$ d) $\sim q \to \sim p$

7. Let p and q be two properties. Then, the contrapositive of the implication $p \to q$ is
   a) $\sim q \to \sim p$ b) $p \to \sim q$ c) $q \to p$ d) $p \leftrightarrow q$

8. If p and q are two propositions, then $\sim (p \leftrightarrow q)$ is
   a) $\sim p \wedge \sim q$ b) $\sim p \vee \sim q$ c) $(p \wedge \sim q) \vee (\sim p \wedge q)$ d) None of these

9. Which of the following is logically equivalent to $\sim (\sim p \to q)$?
   a) $p \wedge q$ b) $p \wedge \sim q$ c) $\sim p \wedge q$ d) $\sim p \wedge \sim q$

10. The contrapositive of $p \Rightarrow \sim q$ is
   a) $\sim p \Rightarrow q$ b) $\sim q \Rightarrow p$ c) $q \Rightarrow \sim p$ d) None of these

11. In which of the following cases, $p \Rightarrow q$ is true?
   a) p is true, q is true b) p is false, q is true c) p is true, q is false d) None of these

12. Which of the following propositions is a tautology?
    a) $\sim (p \to q) \vee (p \wedge \sim q)$ b) $(p \to q) \to (p \wedge \sim q)$ c) $(p \to q) \vee (p \wedge \sim q)$
    d) $(p \to q) \wedge (p \wedge \sim q)$

13. If p:A man is happy
q:A man is rich
Then, the statement, "If a man is not happy, then he is not rich" is written as
    a) $\sim p \to \sim q$ b) $\sim q \to p$ c) $\sim q \to \sim p$ d) $q \to \sim p$

14. Which of the following is false?
    a) $p \vee \sim p$is a tautology
    b) $\sim (\sim) \leftrightarrow p$is a tautology
    c) $(p \wedge (p \to)) \to$is a contradiction
    d) $p \wedge \sim p$is a contradiction

15. Let p and q be two statements. Then, $(\sim p \vee q) \wedge (\sim p \wedge \sim q)$ is a
    a) Tautology b) Contradiction
    c) Neither tautology nor contradiction d) Both tautology and contradiction

16. Logical equivalent proposition to the proposition $\sim(p \vee q)$
    a) $\sim p \wedge \sim q$ b) $\sim p \vee \sim q$ c) $\sim p \to \sim q$ d) $\sim p \leftrightarrow \sim q$

17. What are the truth values of $(\sim p \Rightarrow \sim q)$ and $\sim (\sim p \Rightarrow q)$ respectively, when p and q always speak true in any argument?
    a) T, T b) F, F c) T, F d) F, T

18. Which of the following is a proposition?
    a) I am a lion
    b) A half open door is half closed
    c) A triangle is a circle and 10 is a prime number
    d) Logic is an interesting subject

19. Which of the following is the inverse of the proposition : "If a number is a prime, then it is odd"?
    a) If a number is not a prime, then it is odd b) If a number is not a prime, then it is not odd
    c) If a number is not odd, then it is not a prime d) If a number is odd, then it is a prime

20. Let p be the statement 'Ravi races' and let q be the statement 'Ravi wins'. Then, the verbal translation of
$\sim(p \vee (\sim q))$ is
    a) Ravi does not race and Ravi does not win
    b) It is not true that Ravi races and that Ravi does not win
    c) Ravi does not race and Ravi wins
    d) It is not true that Ravi races or that Ravi does not win

SESSION : 2025-26

DPP
DAILY PRACTICE PROBLEMS

CLASS : XIth **SUBJECT : MATHS**
DATE : **DPP NO. :6**

Topic :-MATHEMATICAL REASONING

1. The contrapositive of $(p \vee q) \rightarrow r$ is
   a) $\sim r \rightarrow (p \vee q)$ b) $r \rightarrow (p \vee q)$ c) $\sim r \rightarrow (\sim p \wedge \sim q)$ d) $p \rightarrow (q \vee r)$

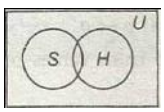
2. Which is not a statement?
   a) $3 > 4$ b) $4 > 3$
   c) Raju is an intelligent boy d) He lives in Agra

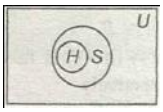
3. If $p = \Delta\, ABC$ is equilateral and q =each angle is 60°. Then, symbolic form of statement
   a) $p \vee p$ b) $p \wedge q$ c) $p \Rightarrow q$ d) $p \Leftrightarrow q$

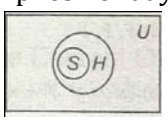
4. Consider the following statements :
p : I shall pass, q : I study
The symbolic representation of the proposition "I shall pass iff I study" is
   a) $p \rightarrow q$ b) $q \rightarrow p$ c) $p \rightarrow \sim q$ d) $p \leftrightarrow q$

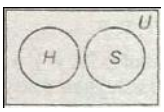
5. The false statement in the following is
   a) $p \wedge (\sim p)$is a contradiction b) $(p \Rightarrow q) \Leftrightarrow (\sim q \Rightarrow \sim p)$ is a contradiction
   c) $\sim (\sim p) \Leftrightarrow p$is a tautology d) $p \vee (\sim p)$ is a tautology

6. The negation of $p \wedge (q \rightarrow \sim r)$ is
   a) $\sim p \wedge (q \wedge r)$ b) $p \vee (q \vee r)$ c) $p \vee (q \wedge r)$ d) $\sim p \vee (q \wedge r)$

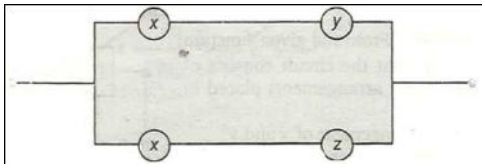
7. H: Set of holidays
S: Set of Sundays
U:Set of day's
Then, the Venn diagram of statement, "Every Sunday implies holiday" is
   a) 

   b) 

   c) 

   d) 

8. The switching function for switching work is



a) $x \wedge y \wedge z$ b) $x \vee y \wedge x \vee z$ c) $x \wedge y \wedge x \vee z$ d) None of these

9. If p and q are two simple propositions, then $p \leftrightarrow q$ is false when
a) $p$and$q$ both are true b) p is false and q is true c) p is fale and q is true
d) None of these

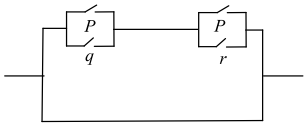
10. Let S be a non-empty subset of R. Consider the following statement
P: There is a rational number $x \in S$ such that $x > 0$.
Which of the following statements is the negation of the statement P?
a) There is a rational number $x \in S$ such that $x \leq 0$
b) There is no rational number $x \in S$ such that $x \leq 0$
c) Every rational number $x \in S$ satisfies $x \leq 0$
d) $x \in S$and$x \leq 0 \Rightarrow x$ is not rational

11. $\sim(p \vee q) \vee (\sim p \wedge q)$is logically equivalent to
a) $\sim p$ b) p c) q d) $\sim q$

12. Let p and q be two statements. Then, $p \vee q$ is false, if
a) p is false and q is true b) Both p and q are false c) Both p and q are true
d) None of these

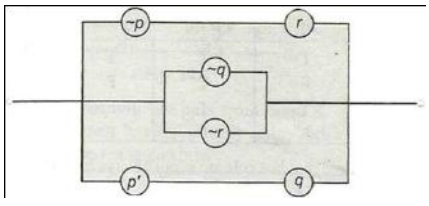
13. The statement $\sim(p \rightarrow q)$ is equivalent to
a) $p \wedge (\sim q)$ b) $\sim p \wedge q$ c) $p \wedge q$ d) $\sim p \wedge \sim q$

14. For the circuit shown below, the Boolean polynomial is



a) $(\sim p \vee q) \vee (p \vee \sim q)$ b) $(\sim p \wedge q) \wedge (p \wedge q)$ c) $(\sim p \wedge \sim q) \wedge (q \wedge p)$ d) $(\sim p \wedge q) \vee (p \vee \sim q)$

15. The switching function of network is



a) $\sim p \vee r \wedge (\sim q \wedge \sim r) \wedge p' \vee q$ b) $(\sim p \wedge r) \wedge (\sim q \vee \sim r) \wedge p' \vee q$
c) $(\sim p \wedge r) \wedge (\sim q \vee \sim r) \wedge p' \vee q$ d) None of the above

16. The proposition $(p \rightarrow \sim p) \wedge (\sim p \rightarrow p)$ is a
    a) Tautology
    b) Contradiction
    c) Neither a tautology nor a contradiction
    d) Tautology and contradiction

17. If $p \Rightarrow (\sim p \vee q)$ is false, the truth value of p and q are respectively
    a) F, T b) F, F c) T, T d) T, F

18. Which of the following is a contradiction?
    a) $p \vee q$ b) $p \wedge q$ c) $p \vee \sim p$ d) $p \wedge \sim p$

19. $\sim(\sim p \rightarrow q) \equiv$
    a) $p \wedge \sim q$ b) $\sim p \wedge q$ c) $\sim p \wedge \sim q$ d) $\sim p \vee \sim q$

20. The converse of the contrapositive of the conditional $p \rightarrow \sim q$ is
    a) $p \rightarrow q$ b) $\sim p \rightarrow \sim q$ c) $\sim q \rightarrow p$ d) $\sim p \rightarrow q$

SESSION : 2025-26

DPP
DAILY PRACTICE PROBLEMS

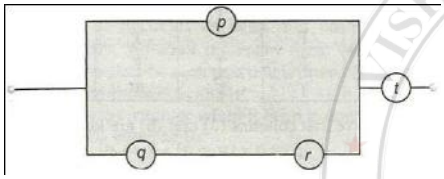
CLASS : XIth **SUBJECT : MATHS**
DATE : **DPP NO. :7**

Topic :-MATHEMATICAL REASONING

1. A proposition is called a tautology, if it is
   a) Always T b) Always F
   c) Sometimes T, sometimes F d) None of the above

2. If p: 4 an even prime number q: 6 is a divisor of 12 and r:the HCF of 4 and 6 is 2, then which one of the following is true?
   a) $(p \vee q)$ b) $(p \vee q) \wedge \sim r$ c) $\sim(q \wedge r) \vee p$ d) $\sim p \vee (q \wedge r)$

3. The switching function for the following network is



   a) $(p \wedge q \vee r) \wedge t$ b) $(p \wedge q \vee r) \vee t$ c) $p \vee r \wedge q \vee t$ d) None of these

4. Which of the following is logically equivalent to $\sim (p \leftrightarrow q)$?
   a) $(p \wedge \sim q) \wedge (q \wedge \sim p)$ b) $p \vee q$ c) $(p \wedge \sim q) \vee (q \wedge \sim p)$ d) None of these

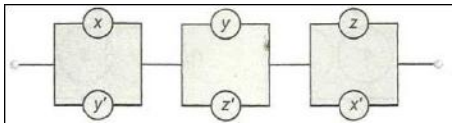
5. The inverse of the proposition $(p \wedge \sim q) \rightarrow r$ is
   a) $\sim r \rightarrow \sim p \vee q$ b) $\sim p \vee q \rightarrow \sim r$ c) $r \rightarrow p \wedge \sim q$ d) None of these

6. Which is a statement?
   a) $x + 1 = 6$ b) $5 \in N$ c) $x + y < 12$ d) None of these

7. Let inputs of p and q be 1 and 0 respectively in electric circuit. Then, output of $p \wedge q$ is
   a) 1 b) 0 c) Both 1 and 0 d) Neither 1 nor 0

8. When does the inverse of the statement $\sim p \Rightarrow q$ results in T?
   a) $p$and$q$ both are true
   b) p is true and q is false
   c) p is false and q is false
   d) Both (b) and (c)

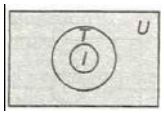
9. The switching function for switching network is

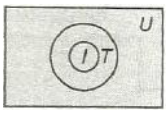


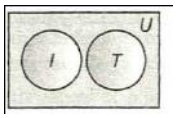
a) $(x \wedge y') \vee (y \wedge z') \vee (z \wedge x')$ b) $(x \wedge y \wedge z) \vee (x' \wedge y' \wedge z')$
c) $(x \vee y') \wedge (y \vee z') \wedge (z \vee x')$ d) None of the above

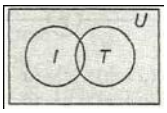
10. If $S(p,q,r) = (\sim P) \vee [\sim(q \wedge r)]$ is a compound statement, then $S(\sim p, \sim q, \sim r)$ is
a) $\sim S(p,q,r)$ b) $S(p,q,r)$ c) $p \vee (q \wedge r)$ d) $p \vee (q \vee r)$

11. Some triangles are not isosceles. Identify the Venn diagram

a) 

b) 

c) 

d) 

12. The negation of $p \wedge \sim (q \wedge r)$ is
a) $\sim p \vee (q \wedge r)$ b) $\sim p \vee (\sim q \vee \sim r)$ c) $p \vee (q \wedge r)$ d) $\sim p \wedge (q \vee r)$

13. Dual of $x \wedge (yx) = x$ is
a) $x \vee (y \wedge x) = x$ b) $x \vee (y \vee x) = x$ c) $(x \wedge y) \vee (x \wedge x) = x$ d) None of these

14. Which of the following sentences is a statements?
a) AArushi is a pretty girl
b) What are you doing?
c) Oh! It is amazing
d) 2 is the smallest prime number

15. The contrapositive of the statement $\sim p \Rightarrow (p \wedge \sim q)$ is
a) $p \Rightarrow (\sim p \vee q)$ b) $p \Rightarrow (p \wedge q)$ c) $p \Rightarrow (\sim p \wedge q)$ d) $\sim p \vee q \Rightarrow p$

16. The statement $p \rightarrow (q \rightarrow p)$ is equivalent to
a) $p \rightarrow (p \leftrightarrow q)$ b) $p \rightarrow (p \rightarrow q)$ c) $p \rightarrow (p \vee q)$ d) $p \rightarrow (p \wedge q)$

17. Dual of $(x' \wedge y')' = x \vee y$ is
a) $(x' \wedge y') = x \wedge y$ b) $(x' \vee y')' = x \wedge y$ c) $(x' \vee y')' = xy$ d) None of these

18. If p: A man is happy
q: Aman is rich
Then, the statement, ""If a man is not happy, then he is not rich" is written as
a) $\sim p \rightarrow \sim q$ b) $\sim q \rightarrow p$ c) $\sim q \rightarrow \sim p$ d) $q \rightarrow \sim p$

19. Which of the following is a tautology?
a) $p \wedge q$ b) $p \vee q$ c) $p \vee \sim p$ d) $p \wedge \sim p$

20. Let p and q be two statement, then $(p \vee q) \vee \sim p$ is
a) Tautology b) Contradiction c) Both (a) and (b) d) None of these

SESSION : 2025-26

DPP
DAILY PRACTICE PROBLEMS

CLASS : XIth **SUBJECT : MATHS**
DATE : **DPP NO. :8**

Topic :-MATHEMATICAL REASONING

1. If the compound statement $p \to (\sim p \vee q)$ is false then the truth value of p and q are respectively-
(A) T, T (B) T, F (C) F, T (D) F, F

2. Consider the statement p : ''New Delhi is a city''. Which of the following is not negation of p ?
(A) New Delhi is not a city (B) It is false that New Delhi is a city
(C) It is not the case that New Delhi is not a city (D) None of these

3. If p is any statement, t is a tautology and c is a contradiction then which of the following is not correct-
(A) $p \wedge (\sim c) \equiv p$ (B) $p \vee (\sim t) \equiv p$ (C) $t \vee c \equiv p \vee t$ (D) $(p \wedge t) \vee (p \vee c) \equiv (t \wedge c)$

4. Which of the following is not a component statement of the statement '100 is divisible by 5, 10 and 11' ?
(A) 100 is divisible by 5 (B) 100 is divisible by 10
(C) 100 is not divisible by 11 (D)100 is divisible by 11

5. The inverse of the statement $(p \wedge \sim q) \to r$ is-
(A) $\sim(p \vee \sim q) \to \sim r$ (B) $(\sim p \wedge q) \to \sim r$
(C) $(\sim p \vee q) \to \sim r$ (D) None of these

6. Which of the following is logically equivalent to $\sim (p \leftrightarrow q)$
(A) $(\sim p) \leftrightarrow q$ (B) $(\sim p) \leftrightarrow (\sim q)$ (C) $p \to (\sim q)$ (D) $p \to q$

7. Suppose that x and y are positive real numbers.
Let $p : x < y \Rightarrow x^2 < y^2$ and $q : x^2 < y^2 \Rightarrow x < y$. Then
(A) $p \Rightarrow q$ and q p (B) p q and $q \Rightarrow p$ (C) $p \Leftrightarrow q$ (D) $p \Rightarrow q$ and $\sim q \Rightarrow p$

8. The statement $\sim(p \to q)$ $(\sim p \vee \sim q)$ is-
(A) a tautology (B) a contradiction
(C) neither a tautology nor a contradiction (D) None of these

9. Which of the following statements is using an 'inclusive Or'' ?
(A) A number is either rational or irrational (B) All integers are positive or negative
(C) The office is closed if it is a holiday or a Sunday (D) Sum of two integers is odd or even

10. If statement $p \to (q \vee r)$ is true then the truth values of statements p, q, r respectively-

(A) T, F, T (B) F, T, F (C) F, F, F (D) All of these

11. If x = 5 and y = –2 then x – 2y = 9. The contrapositive of this statement is
(A) If x – 2y = 9 then x = 5 and y = –2 (B) If x – 2y ≠ 9 then x ≠ 5 and y ≠ –2
(C) If x – 2y ≠ 9 then x ≠ 5 or y ≠ –2 (D) If x – 2y ≠ 9 then either x ≠ 5 or y = –2

12. If S*(p, q) is the dual of the compound statement S(p, q) then S*(~p, ~q) is equivalent to-
(A) S(~p, ~q) (B) ~S(p, q) (C) ~S*(p, q) (D) None of these

13. Which of the following is a logical statement ?
(A) Open the door (B) What an intelligent student !
(C) Are you going to Delhi (D) All prime numbers are odd numbers

14. $(\sim p \vee \sim q)$ is logically equivalent to-
(A) $p \wedge q$ (B) $\sim p \rightarrow q$ (C) $p \rightarrow \sim q$ (D) $\sim p \rightarrow \sim q$

15. If p is true and q is false, then which of the following statement is not true?
(A) (B) $p \Rightarrow q$ (C) (D) $q \Rightarrow p$

16. The contrapositive of statement "Something is cold implies that it has low temperature" is
(A) If something does not have low temperature, then it is not cold.
(B) If something does not have low temperature then it is cold
(C) Something is not cold implies that it has low temperature
(D) If something have low temperature, then it is not cold.

17. For any three simple statement p, q, r the statement $(p \wedge q) \vee (q \wedge r)$ is true when-
(A) p and r true and q is false (B) p and r false and q is true
(C) p, q, r all are false (C) q and r true and p is false

18. Consider the statement p : ''Everyone in Germany speaks German'' which of the following is not negation of p''
(A) not everyone in Germany speaks German
(B) no one in Germany speaks German
(C) there are persons in Germany who do not speak German
(D) There is atleast one person in Germany who does not speak German.

19. If p is any statement, t and c are a tautology and a contradiction respectively then which of the following is not correct-
(A) $p \wedge t \equiv p$ (B) $p \wedge c \equiv c$ (C) $p \vee t \equiv c$ (D) $p \vee c \equiv p$

20. Negation of the statement $p \rightarrow (q \wedge r)$ is
(A) $\sim p \rightarrow \sim(q \wedge r)$ (B) $\sim p \vee (q \wedge r)$ (C) $(q \wedge r) \rightarrow p$ (D) $p \wedge (\sim q \vee \sim r)$

SESSION : 2025-26

DPP
DAILY PRACTICE PROBLEMS

CLASS : XIth **SUBJECT : MATHS**
DATE : **DPP NO. :9**

Topic :-MATHEMATICAL REASONING

1. Which of the following is correct-
(A) $(\sim p \vee \sim q) \equiv (p \wedge q)$ (B) $(p \to q) \equiv (\sim q \to \sim p)$
(C) $\sim(p \to \sim q) \equiv (p \wedge \sim q)$ (B) $\sim(p \ \ q) \equiv (p \to q) \vee (q \to p)$

2. Which one statement gives the same meaning of statement
"The Banana trees will bloom if it stays warm for a month."
(A) It stays warm for a month and the banana trees will bloom
(B) If it stays warm for a month, then the Banana trees will bloom
(C) It stays warm for a month or the banana trees will bloom
(D) None of these

3. The negation of the statement $q \vee (p \wedge \sim r)$ is equivalent to-
(A) $\sim q \wedge (p \to r)$ (B) $\sim q \wedge \sim(p \to r)$ (C) $\sim q \wedge (\sim p \wedge r)$ (D) None of these

4. Which of the following statement are not logically equivalent-
(A) $\sim(p \vee \sim q)$ and $(\sim p \wedge q)$ (B) $\sim(p \to q)$ and $(p \wedge \sim q)$
(C) $(p \to q)$ and $(\sim q \to \sim p)$ (D) $(p \to q)$ and $(\sim p \wedge q)$

5. The negation of the statement "If a quadrilateral is a square then it is a rhombus".
(A) If a quadrilateral is not a square then it is a rhombus
(B) If a quadrilateral is a square then it is not a rhombus
(C) a quadrilateral is a square and it is not a rhombus
(D) a quadrilateral is not a square and it is a rhombus

6. The negative of the statement "If a number is divisible by 15 then it is divisible by 5 or 3"
(A) If a number is divisible by 15 then it is not divisible by 5 and 3
(B) A number is divisible by 15 and it is not divisible by 5 or 3
(C) A number is divisible by 15 or it is not divisible by 5 and 3
(D) A number is divisible by 15 and it is not divisible by 5 and 3

7. The statement 'x is an even number implies that x is divisible by 4' means the same as
(A) x is divisible by 4 is necessary condition for x to be an even number
(B) x is an even number is a necessary condition for x to divisible by 4
(C) x is divisible by 4 is a sufficient condition for x to be an even number
(D) x is divisible by 4 implies that x is not always an even number

8. The negation of the statement "The sand heats up quickly in the sun and does not cool down fast at night"is
(A) The sand does not heat up quickly in the sun and it does not cool down fast at night
(B) Either the sand does not heat up quickly in the sun or it cools down fast at night
(C) The sand heats up quickly in the sun and it cools down fast at night
(D) The sand heats up quickly in the sun or it cools down fast at night

9. The negation of the statement "2 + 3 = 5 and 8 < 10" is-
(A) $2 + 3 \neq 5$ and 8 10
(B) $2 + 3 \neq 5$ or $8 > 10$
(C) $2 + 3 \neq 5$ or $8 \geq 10$
(D) None of these

10. The statement "If $2^2 = 5$ then I get first class" is logically equivalent to-
(A) $2^2 = 5$ and I don't get first class
(B) $2^2 = 5$ or I do not get first class
(C) $2^2 \neq 5$ or I get first class
(D) None of these

11. If p, q, r are simple propositions, with truth values T, F, T respectively then the truth value of $(\sim p\ q)\ \sim r \Rightarrow p$ is
(A) true (B) false (C) true if r is false (D) true if q is true

12. Which of the following statement convey different meaning from the others?
(A) p is a necessary condition for q
(B) p only if q
(C) p implies q
(D) ~ q implies ~ p

13. Negation of the statement $(p \wedge r) \rightarrow (r \vee q)$ is-
(A) $\sim(p \wedge r) \rightarrow \sim(r \vee q)$ (B) $(\sim p \vee \sim r) \vee (r \vee q)$ (C) $(p \wedge r) \wedge (r \wedge q)$ (D) $(p \wedge r) \wedge (\sim r \wedge \sim q)$

14. The converse of the statement 'p implies q' is
(A) ~ q implies ~ p (B) q implies p (C) p only if q (D) ~ p implies q

15. Which of the following statement is a tautology-
(A) $(\sim p \vee \sim q) \vee (p \vee \sim q)$
(B) $(\sim p \vee \sim q) \wedge (p \vee \sim q)$
(C) $\sim p \wedge (\sim p \vee \sim q)$
(D) $\sim q \wedge (\sim p \vee \sim q)$

16. The negation of the statement ' is not a complex number' is
(A) is a rational number
(B) is an irrational number
(C) is a real number
(D) is a complex number

17. Statement $(p \wedge q) \rightarrow p$ is-
(A) a tautology
(B) a contradiction
(C) neither (1) nor (2)
(D) None of these

18. For the compound statement
'All prime numbers are either even or odd'. Which of the following is true?
(A) Both component statements are false
(B) Exactly one of the component statements is true
(C) At least one of the component statements is true
(D) Both the component statements are true

19. Which of the following is wrong-

(A) $p \vee \sim p$ is a tautology

(B) $\sim(\sim p)$ p is a tautology

(C) $p \wedge \sim p$ is a contradiction

(D) $((p \wedge p) \rightarrow q) \rightarrow p$ is a tautology

20. Which of the following is a statement-

(A) I am Lion

(B) Logic is an interesting subject

(C) A triangle is a circle and 10 is a prime number

(D) None of these

SESSION : 2025-26

DPP
DAILY PRACTICE PROBLEMS

CLASS : XIth **SUBJECT : MATHS**
DATE : **DPP NO. :10**

Topic :-MATHEMATICAL REASONING

1. The statement p(qp) is equivalent
(A) p(pq) (B) p(p q) (C) p (pq) (D) p

2. Let p be the statement "x is an irrational number", q be the statement "y is a trascendental number", and r be the statement "x is a rational number iff y is a transcendental number".
Statement –I : r is equivalent to either q or p.
Statement –II : r is equivalent to
(A) Statement –I is false, Statement –II is true
(B) Statement–I is true, Statement–II is false
(C) Statement–I is true, Statement–II is true; Statement–II is a correct explanation for Statement–I
(D) Statement–I is true, Statement–II is true; Statement–II is not a correct explanation for Statement–I

3. Statement–I : $\sim(p \sim q)$ is equivalent to pq.
Statement–II : $\sim(p \sim q)$ is a tautology.
(A) Statement–I is true, Statement–II is false.
(B) Statement–I is false, Statement–II is true.
(C) Statement–I is true, Statement–II is true ; Statement–II is a correct explanation for Statement–I.
(D) Statement–I is true, Statement–II is true ; Statement–II is not a correct explanation for statement–I.

4. Let S be a non-empty subset of R.
Consider the following statement :
p : There is a rational number $x \in S$ such that $x > 0$
which of the following statements is the negation of the statement p ?
(A) There is a rational number $x \in S$ such that $x \le 0$ (C) There is no rational number $x \in S$ such that $x \le 0$
(C) Every rational number $x \in S$ satisfies $x \le 0$ (D) $x \in S$ and $x \le 0 \Rightarrow$ x is not rational

5. Consider the following statements

p : Suman is brilliant

q : Suman is rich

r : Suman is honest

The negation of the statement "Suman is brilliant and dishonest if and only if Suman is rich" can be expressed as :-

(A) ~ q ↔ ~ p r (B) ~ (p ~ r) ↔ q (C) ~ p (q ↔ ~ r) (D) ~ (q ↔ (p ~ r))

6. The only statement among the followings that is a tautology is :

(A) q → [p (p → q)] (B) p (p q) (C) p (p q) (D) [p (p → q)] → q

7. The negation of the statement

"If I become a teacher, then I will open a school", is

(A) I will not become a teacher or I will open a school.

(B) I will become a teacher and I will not open a school.

(C) Either I will not become a teacher or I will not open a school.

(D) Neither I will become a teacher nor I will open a school.

8. The statement ~ (p ↔ ~ q) is :

(A) equivalent to p ↔ q (B) equivalent to ~ p ↔ q

(C) a tautology (D) a fallacy

9. The negation of ~ s (~ r s) is equivalent to :

(A) s (r ~ s) (B) s r (C) s ~ r (D) s (r ~ s)

10. The Boolean Expression (p~ q)q(~ q p) is equivalent to :

(A) p q (B) p q (C) p ~ q (D) ~ p q

11. If a sentence can be judged to be true or false, but not both then it is called

A) an open sentence B) a statement

C) a tautology D) a contradiction

12. The truthfulness or falsity of a statement is called its

A) negation B) converse

C) inverse D) truth value

13. Which of the following is a proposition

A) Logic is an interesting subject

B) He is very talented C) I am a lion

D) A triangle is a circle and 10 is a prime number

14. Which of the following is not a proposition

A) 3 is a prime

B) Mathematics is interesting

C) 5 is an even integer

D) is irrational

15. Denial of a statement is called is

A) negation B) converse C) inverse D) truth value

16. Negation of the compound proposition: If the examination is difficult, then I shall pass if I study hard

A) The examination is difficult and I study hard and I shall pass

B) The examination is difficult and I study hard but I shall not pass

C) The examination is not difficult and I study hard and I shall pass

D) All of these

17. Which of the following is not logically equivalent to the proposition : " A real number is either rational or irrational"

A) If a number is neither rational nor irrational then it is not real

B) If a number is not a rational or not an irrational, then it is not real

C) If a number is not real, then it is neither rational nor irrational

D) If a number is real, then it is rational or irrational

18. "Earth is a planet", the negation of this statement is

A) The earth is round

B) The earth is not round

C) The earth revolves round the sun

D) The earth is not a planet

19. The disjunction of the statement, " It is raining"; The sun is shining", is

A) It is raining and the sun is shining

B) It is raining or the sun is shining

C) It is raining and the sun is not shining

D) It is not raining or the sun is not shining

20. The negation of the proposition: " If a number is divisible by 15, then it is divisible by 5 or 3:.

A) If a number is divisible by 15, then it is not divisible by 5 and 3.

B) A number is divisible by 15, and it is not divisible by 5 and 3.

C) A number is divisible by 15, then it is not divisible by 5 or 3.

D) A number is not divisible by 15 or it is not divisible by 5 and 3.