

SITRC**SE Computer Examination , Aug 2018****DM_2018****Time : 60 Min****Passing Marks : 12****Maximum Marks : 30**

1. $(A \vee \neg A) \vee (q \vee T)$ is a _____ (1)
A) Tautology
B) Contradiction
C) Contingency
D) None of the mentioned
2. Which of the following option is true? (1)
A) If the Sun is a planet, elephants will fly
B) $3 + 2 = 8$ if $5 - 2 = 7$
C) $1 > 3$ and 3 is a positive integer
D) $-2 > 3$ or 3 is a negative integer
3. The set of positive integers is _____ (1)
A) Infinite
B) Finite
C) Subset
D) Empty
4. Let P, Q, R be true, false, false, respectively, which of the following is true (1)
A) $P \wedge (Q \wedge \neg R)$
B) $(P \rightarrow Q) \wedge \neg R$
C) $Q \leftrightarrow (P \wedge R)$
D) $P \leftrightarrow (Q \vee R)$
5. Let P: I am in Delhi. , Q: Delhi is clean. ; then $q \wedge p(q \text{ and } p)$ is: (1)
A) Delhi is clean and I am in Delhi
B) Delhi is not clean or I am in Delhi
C) I am in Delhi and Delhi is not clean
D) Delhi is clean but I am in Mumbai
6. Which of the following statement is correct? (1)
A) $p \vee q \equiv q \vee p$
B) $\neg(p \wedge q) \equiv \neg p \vee \neg q$
C) $(p \vee q) \vee r \equiv p \vee (q \vee r)$
D) All of mentioned

7. The compound statement $A \rightarrow (A \rightarrow B)$ is false, then the truth values of A, B are respectively (1)
 A) T, T
 B) F, T
 C) T, F
 D) F, F
8. $p \rightarrow q$ is logically equivalent to: (1)
 A) $\neg p \vee \neg q$
 B) $p \vee \neg q$
 C) $\neg p \vee q$
 D) $\neg p \wedge q$
9. If a bit string contains $\{0, 1\}$ only, having length 5 has no more than 2 ones in it. Then how many such bit strings are possible? (1)
 A) 14
 B) 12
 C) 15
 D) 16
10. The converse of $p \rightarrow q$ is the proposition: (1)
 A) $\neg q \rightarrow \neg p$
 B) $\neg q \rightarrow p$
 C) $q \rightarrow p$
 D) $\neg q \rightarrow p$
11. Let $R = \{ (3, 3), (6, 6), (9, 9), (12, 12), (6, 12), (3, 9), (3, 12), (3, 6) \}$ be a relation on the set $A = \{3, 6, 9, 12\}$. The relation is (1)
 A) reflexive and transitive
 B) reflexive only
 C) an equivalence relation
 D) reflexive and symmetric only
12. Number of subsets of a set of order three is (1)
 A) 2
 B) 4
 C) 6
 D) 8
13. If in a bits string of $\{0, 1\}$, of length 4, such that no two ones are together. Then total number of such possible strings are? (1)
 A) 1
 B) 5
 C) 7
 D) 4

14. Which of the following are De-Morgan's law (1)
- A) $P \wedge (Q \vee R) \equiv (P \wedge Q) \vee (P \wedge R)$ B) $\neg(P \wedge R) \equiv \neg P \vee \neg R, \neg(P \vee R) \equiv \neg P \wedge \neg R$
- C) $P \vee \neg P \equiv \text{True}, P \wedge \neg P \equiv \text{False}$ D) None of the mentioned
15. $(A \vee F) \vee (A \vee T)$ is always _____ (1)
- A) True B) False
16. Complement of set can be represented using set builder notation as follows: (1)
- A) $A' = \{x : x \in U \text{ and } x \notin A\}$ B) $A' = \{x : x \in A \text{ and } x \notin U\}$
- C) Both A & B D) None of these
17. "Everyone wants to learn cosmology." This argument may be true for which domains? (1)
- A) All students in your cosmology class B) All the cosmology learning students in the world
- C) Both of the mentioned D) None of the mentioned
18. What is the value of x after this statement, assuming initial value of x is 5? (1)
'if x equals to one then $x=x+2$ else $x=0$ '.
- A) 1 B) 3
- C) 0 D) 2
19. Let $R = \{ (1, 3), (4, 2), (2, 4), (2, 3), (3, 1) \}$ be a relation on the set $A = \{1, 2, 3, 4\}$. (1)
The relation R is
- A) function B) transitive
- C) not symmetric D) reflexive
20. The Ex-nor of this string "01010101" with "11111111" is (1)
- A) 10101010 B) 00110100
- C) 01010101 D) 10101001

21. Let $L(x, y)$ be the statement “x loves y,” where the domain for both x and y consists of all people in the world.
Use quantifiers to express, “Joy is loved by everyone.”
- A) $\forall x L(x, \text{Joy})$ B) $\forall y L(\text{Joy}, y)$
C) $\exists y \forall x L(x, y)$ D) $\exists x \neg L(\text{Joy}, x)$

22. Let $Q(x, y)$ be the statement “ $x + y = x - y$.” If the domain for both variables consists of all integers, what is the truth value of $\exists x Q(x, 4)$.
- A) True B) False

23. What is the Cartesian product of $A = \{1, 2\}$ and $B = \{a, b\}$? (2)

- A) $\{(1, a), (1, b), (2, a), (2, b)\}$ B) $\{(1, 1), (2, 2), (a, a), (b, b)\}$
C) $\{(1, a), (2, a), (1, b), (2, b)\}$ D) $\{(1, 1), (a, a), (2, a), (1, b)\}$

24. What is the dual of $(A \wedge B) \vee (C \wedge D)$? (2)

- A) $(A \vee B) \vee (C \vee D)$ B) $(A \vee B) \wedge (C \vee D)$
C) $(A \vee B) \vee (C \wedge D)$ D) $(A \wedge B) \vee (C \vee D)$

25. Translate $\forall x \exists y (x < y)$ in English, considering domain as real number for both the variable. (2)

- A) For all real number x there exists a real number y such that x is less than y B) For every real number y there exists a real number x such that x is less than y
C) For some real number x there exists a real number y such that x is less than y D) For each and every real number x and y such that x is less than y