**Discrete Mathematics**

**Objective Questions**

1. A **Contradiction**  is a compound statement that is always false.

2. A bi-conditional statement is true iff both the propositions are true 🡪 True

3. The implication p🡪q is equivalent to [ a ]

(a) ~p v q (b) p ∧ q (c) (∼p v r) (d) (q v ∼r)

4 If A and B are disjoint then A∩B is [ c ]

(a) A (b) B (c) Φ (d) AUB

5. The distributive law over three sets A∩ (BUC) = **A(∩B)U(A∩C)**

6. The truth table for (p ∨ q) ∨ (p ∧ r) is the same as the truth table for [ d ]

(a) (p ∨ q) ∧ (p ∨ r) (b) (p ∨ q) ∧ r (c) (p ∨ q) ∧ (p ∧ r) (d) p ∨ q

7. The boolean function [∼(∼p∧q)∧∼(∼p∧∼q)]∨(p∧r) is equal to the boolean function [ d ] (a) q (b) p ∧ r (c) p ∨ q (d) p

8. In direct proof method, the given hypotheses are considered as true 🡪 True

9. The Tautology contains all truth values as [ **a ]**   
(a) True (b)False (c) Both (d) None

10. The Cardinality of a set represents \_\_\_\_\_\_\_\_\_\_. [ a ]  
(a) Total number of elements (b) Product of elements (c) Maximum Element (d) None

11.  A **Set** is an ordered collection of objects

12. Power set of empty set has exactly \_\_\_\_\_ subset. [ a ]  
 (a) one (b) two (c) zero (d) three

13.  What is the Cartesian product of a = {1, 2} and b = {a, b}? [ c ]  
(a) {(1, a), (1, b), (2, a), (b, 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)}

14.  If A is subset to B, then **A∩B=A and AUB=B**

15. The **Power set** of a set is the family of all the subsets of a set.

16. If a variable is associated with some quantifier, then the variable is called **Bounded** variable.

17. Which of the following formula is true for symmetric difference [ d ]

(a) (aUb)-(a∩b) (b) (a∩b) –(aUb) (c) (a-b)U(b-a) (d)a &b

18. Which of the following is a boolean matrix [ c ]

(a) all entries are 0’s (b) all entries are 1’s (c) all entries are 0’s &1’s (d) b & c

19. Two sets have the same cardinality if and only if they are **Bi-jective**

20. Equivalence relation includes \_\_\_\_\_\_\_\_ [ d ]

(a) symmetric (b) reflexive (c)transitive (d) all

21. The method of reasoning is called [ c ]

(a) statement (b) proposition (c) logic (d)law

22. The set of all ordered pairs that take their first coordinates from A and second from B is called the Cartesian product of A with B, and is denoted A × B

23. A relation on A is any subset of A×A. Sometimes these are called binary relations

24. R is symmetric if whenever (a, b) is in R, the pair (b, a) is also in R.

25. A = {1, 2, 3} and R is the relation R = {(1, 1),(1, 2),(2, 2),(3, 3)}. This is a reflexive relation

26. A = {1, 2, 3, 4} and R is the relation R = {(1, 4),(1, 2),(2, 4),(3, 4)}. This is a irreflexive relation

27. A relation on a set is an equivalence relation if it is reflexive, symmetric and transitive

28. A relation R on set A is a partial order if it is reflexive,antisymmetric and transitive

29. If Any two elements in a poset are comparable such a partial order is a total order or linear order

30. A relation on a finite set can be represented by digraph

31. A relation R from a finite set to a finite set can be represented by its adjacency matrix

32. A digraph can be a useful device for representing a relation, especially if the relation isn’t “too large” or complicated.

33. The inverse relation is also called the converse relation

34. A binary relation is the special case *n* = 2 of an *n*-ary relation

35. A linear order where every nonempty subset has a least element is called a well-order.

**Descriptive Questions**

**Unit-1**

|  |  |  |
| --- | --- | --- |
|  | | |
| **1** | **A** |  |
|  | **B** |  |
| **2** | **A** |  |
|  | **B** |  |
| **3** | **A** |  |
|  | **B** |  |
| **4** | |  |
| **5** | **A** |  |
|  | **B** |  |
| **6** | **A** |  |
|  | **B** |  |
| **7** | **A** |  |
|  | **B** |  |
| **8** | |  |

**Unit-2**

|  |  |
| --- | --- |
| **1.** |  |
| **2.** |  |
| **3.** |  |
| **4.** |  |
| **5.** |  |
| **6.** |  |
| **7.** |  |