REV-01
BCA/59/64

2023/06

SET A

BACHELOR OF COMPUTER APPLICATION
SECOND SEMESTER
DISCRETE MATHEMATICS
BCA-204

[USE OMR SHEET FOR OBJECTIVE PART]

Duration: 1hr. 30 mins. **Full Marks: 35**

Objective

Time: 15 mins. **Marks: 10**

Choose the correct answer from the following: ***1×10=10***

1. A..... is an ordered collection of objects.
   a. Relation b. Function
   c. Set d. Proposition

2. Power set of empty set has exactly..... subset.
   a. One b. Two
   c. Zero d. Three

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

4. The set of positive integers is.....
   a. Infinite b. Finite
   c. Subset d. Empty

5. If proposition P is true under all circumstances, it is a.....
   a. Boolean b. Tautology
   c. Contradiction d. Binomial

6. The truth table contains only T in the..... column in tautology.
   a. Initial b. Middle
   c. Final d. None

7. .....are statements that are always false.
   a. Boolean b. Negation
   c. Contradiction d. Tautology

8. If p is..... and q is....., then $(p \rightarrow q) \leftrightarrow (\sim q \rightarrow \sim p)$ is true?
   a. True, false b. False, true
   c. True, true d. All of the above

9. A graph is a collection of.....
   a. Row and columns b. Vertices and edges
   c. Equations d. None of these

10. The degree of any vertex of graph is.....

a. The number of edges incident with vertex
b. Number of vertex in a graph
c. Number of vertices adjacent to that vertex
d. Number of edges in a graph

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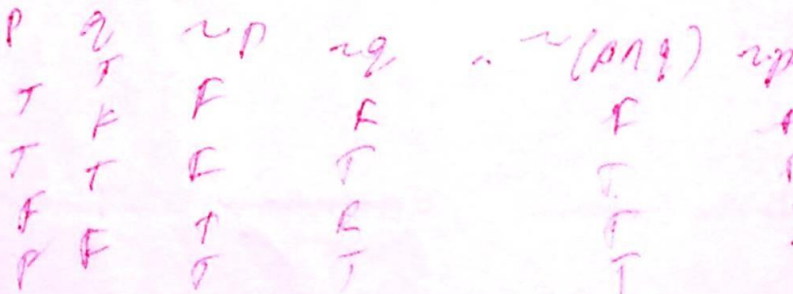
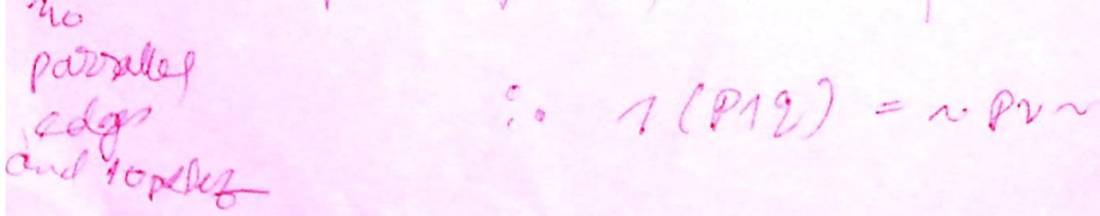




Descriptive

Time : 1 hr. 15 mins. **Marks : 25**

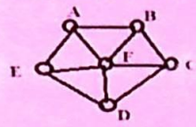
[Answer question no.1 & any two (2) from the rest]

1. In a class of 100 students 50 students drink tea, 40 students drink coffee and 10 students drink both. How many students drink neither tea nor coffee? 5

2. If $U = \{1, 2, 3, 4, 5, 6\}$ 5×2=10
   $A = \{2, 3, 5\}$
   $B = \{1, 3, 5, 6\}$
   Then find the followings:
   a) $A \Delta B$
   b) $A^c \cup B^c$
   c) $A^c \cap B^c$
   d) $A - B$
   e) $B - A$

3. a) Show that $\sim (p \vee q)$ and $\sim p \wedge \sim q$ are logically equivalent. 5+5=10
   b) Make a truth table for $p \wedge (q \vee \sim r)$

4. a) Calculate the degree of each vertices of the following graph. 5+5=10



   b) Write down the characteristics of Isomorphic Graph?

5. a) Define Graph, Regular graph, Complete graph, General graph and Simple graph. 5+5=10
   b) What do you mean by converse, inverse and contrapositive statement?

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