

**BACHELOR OF COMPUTER APPLICATION
SECOND SEMESTER (REPEAT)
DISCRETE MATHEMATICS
BCA-204**

[USE OMR FOR OBJECTIVE PART]

**SET
A**

Duration: 1.30 hrs.

Full Marks: 35

Time: 15 min.

Marks: 10

$$1 \times 10 = 10$$

Choose the correct answer from the following:

- Calculate the number edges of complete graph of 4 vertices
 - 2
 - 4
 - 5
 - 6
- Degree of pendant vertex is
 - 0
 - 1
 - 2
 - 3
- Which one of the following is correct equivalence involving Bi-conditional
 - $\sim (p \leftrightarrow q) = p \leftrightarrow \sim q$
 - $\sim (p \leftrightarrow q) = \sim p \leftrightarrow q$
 - $\sim (p \leftrightarrow q) = p \wedge \sim q$
 - $\sim (p \leftrightarrow q) = p \leftrightarrow q$
- Which one of the following is correct equivalence involving Bi-conditional
 - $p \leftrightarrow q = (p \rightarrow q) \leftrightarrow (q \rightarrow p)$
 - $p \leftrightarrow q = (p \rightarrow q) - (q \rightarrow p)$
 - $p \leftrightarrow q = (p \rightarrow q) + (q \rightarrow p)$
 - $p \leftrightarrow q = (p \rightarrow q) \wedge (q \rightarrow p)$
- Which one of the following is correct Commutative law from the following propositions
 - $(p \vee q) \equiv (q \vee p)$
 - $(p \wedge q) \equiv (q \wedge p)$
 - Both i and ii
 - None of these
- Which one of the following is identity law?
 - $A \cup A = \emptyset$
 - $\emptyset \cup \emptyset = A$
 - $A \cup \emptyset = A$
 - None of these
- Which one of the following is Idempotent law?
 - $A \cup A = \emptyset$
 - $A \cup A = A$
 - $A \cup \emptyset = A$
 - None of these
- Which one of the following is De Morgan law holds?

a. $(A \cup B)^c = A^c \cap B^c$

b. $(A \cap B)^c = A^c \cup B^c$

c. Both i and ii

d. none of these

9. Which one of the following is correct statement?

a. $N \subset Z \subset Q$

b. $Q \subset R$

c. Both a and b

d. none of these

10. Which one of the correct associative law for three sets

a. $(A \cup B) \cup C = A \cup (B \cup C)$

b. $(A \cup B) \cup C = (A \cup B) \cap C$

c. $(A \cup B) \cup C = (A \cap B) \cup C$

d. None of these

(Descriptive)

Time : 1 hrs. 15 min.

Marks : 25

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

1. Construct the truth table from the following propositions and determine whether it is tautologies or contradictions $\{(p \vee q) \wedge (p \rightarrow r) \wedge (q \rightarrow r)\} \rightarrow r$

5

2. a) In a class of 35 students, 24 like to play cricket and 16 like to play football. Also each students likes to play at least one of the two games. How many students like to play both cricket and football?

5

- b) Without using truth table prove that
 $(\sim p \vee q) \wedge (p \wedge (p \wedge q)) = p \wedge q$

5

3. a. In a survey of 600 students in a school, 150 students were found to be taking tea and 225 taking coffee, 100 were taking both tea and coffee. Find how many students were taking neither tea nor coffee?

5

- b. There are 200 individuals with a skin disorder, 120 had been exposed to the chemical A, 50 to chemical B and 30 to both the chemicals A and B. Find the numbers of individuals exposed to chemical A but not chemical B?

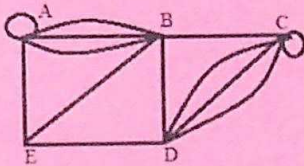
5

4. Write down the definitions of the following

2+2+1=5

- a. Complete graph
- b. Regular graph
- c. Degrees of a graph

Find the number of vertices, the number of edges and the degree of each vertex from the following undirected graphs. Verify s the Handshaking theorem



5

5. a. Construct the truth table from the given

5

propositions

$$\sim (q \rightarrow r) \bigwedge r \bigwedge (p \rightarrow q)$$

- b. Construct the truth table from the given propositions

$$(p \rightarrow (q \rightarrow s)) \bigwedge (\sim r \wedge p) \wedge q' \Rightarrow r \rightarrow s$$

== *** ==