

Sub:- Discrete Structures

Paper:- C4: CSC - HC - 202B

Total Marks: 50

Last Date of Submission: On or before 7th August

- 1) Which of the following is/are tautology? 1.
(a) $(a \vee b) \rightarrow (b \wedge c)$ (b) $(a \wedge b) \rightarrow (b \vee c)$
(c) $(a \vee b) \rightarrow (b \rightarrow c)$ (d) $(a \rightarrow b) \rightarrow (b \rightarrow c)$
- 2) $p \leftrightarrow q = p \rightarrow \neg q$ is true or false. 1.
- 3) The union of two equivalence relation is also an equivalence relation. True or false? 1.
- 4) Maximum number in a n-node undirected graph without self loops is 1.
(a) n^2 (b) $n(n-1)/2$ (c) $(n-1)$ (d) $(n+1)(n)/2$
- 5) G is a simple, connected, undirected graph. Some vertices of G are of odd degree. Add a node v to G and make it adjacent to each odd degree vertex of G . The resultant graph is to be 1.
(a) Regular (b) Complete (c) Hamiltonian (d) Euler

6) Define following:- $7 \times 2 = 14$

(a) Simple graph (b) Connected graph

(c) Regular graph (d) Complete graph.

(e) Bipartite graph. (f) cyclic graph.

7) How many edges have each of the following graph.
 $2+2=4$.

(i) K_{10} (ii) $K_{5,7}$

8) Prove that the statement $(p \rightarrow q) \leftrightarrow (\sim q \rightarrow \sim p)$ is a tautology. 5.

9) If P represents 'This book is good' and Q represents 'This book is cheap'. write the following sentences in symbolic form:- 5.

(a) This book is good and cheap.

(b) This book is not good but cheap.

(c) This book is costly, but good.

(d) This book is neither good nor cheap.

(e) This book is either good or cheap.

10) Define worst-case, Best-case and Average case. 3.

11) If $4 \times P_3 = n + 1 \times P_3$, then find out n . 3.

12) Explain the Pigeonhole Principle. 4.

13) Define Recurrence Relations. What is order of the Recurrence Relation. $2+1=3$.

14) Find out the Indegree and outdegree of the graph given below:- 4.

