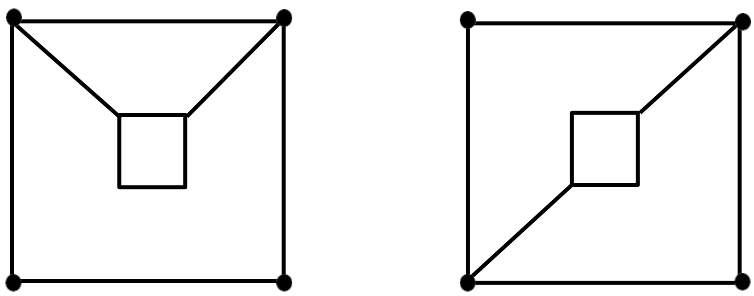
CHAPTER: GRAPH THEORY

(1)	Define with example: graph, nodes and edges.
(2)	Define with example: directed graph, undirected graph, mixed graph, multi graph, simple graph, weighted graph and null graph.
(3)	Define with example: isomorphism of graphs.
(4)	Define with example: degree of a node, odd node, even node, pendant node and isolated node for undirected graph.
(5)	Define with example: indegree, outdegree and total degree for directed graph.
(6)	Check whether the following pair of graphs G & H are isomorphic or not with description. (A).  G H (B)  G H
(7)	Define with example: indegree, outdegree and total degree for directed graph.
(8)	Define with example: indegree, outdegree and total degree for directed graph.

(9)	Determine the number of edges in a graph with 6 nodes, 2 of degree 4 and 4 of degree 2. Draw two such graphs.
(10)	Find whether K_6 and $K_{3,3}$ graphs are isomorphic or not?
(11)	Draw a graph which contains an Eulerian circuit.
(12)	Draw a graph which contains an Eulerian path but does not contain an Eulerian circuit.
(13)	Find under what condition $K_{m,n}$ the complete bipartite graph will have an Eulerian circuit.
(14)	Hamiltonian circuit exists in complete bipartite graph. Justify your answer.
(15)	Find Hamiltonian path and a Hamiltonian circuit in $K_{4,3}$.
	CHAPTER:TREES
(16)	Define with example: acyclic graph, tree, directed tree, forest, root, leaf node, branch node and level of a node.
(17)	Define with example: binary tree, complete binary tree, m-ary tree and complete m- ary tree.
(18)	Which trees are complete bipartite graphs?
(19)	How many internal vertices does a full binary tree with h levels have?
(20)	What is total number of nodes in a full binary tree with 20 leaves?

CHAPTER: RELATION AND PARTIAL ORDERING

(1)	$A = \{1,2,3,4\}$ and B $= \{1,4,6,8,9\}$ aRb iff b = a^2 then find relation matrix M_R.
(2)	$A = \{1,2,3,4,6\} = B$, aRb iff a/b (a divides b) then find relation matrix M_R.
(3)	$A = \{1,2,3,4,8\}$, aRb iff a/b (a divides b) then find the diagraph of relation.
(4)	Define the following terms with example: Binary relation, Domain, Range, Reflexive , Symmetric, Transitive relation.
(5)	Give example of a relation which is (a) neither reflexive nor irreflexive, (b) both symmetric and antisymmetric.
(6)	Show whether the following relation are transitive: $R_1=\{(1,1)\}$, $R_2=\{(1,2),(2,2)\}$ $R_2=\{(1,2),(2,3),(1,3),(2,1)\}$.
(7)	Let X={1,2,3,4} and R=$\{(x,y): x > y\}$.Draw the graph of R and give its matrix.
(8)	Define with examples: Partition, Equivalence relation, Equivalence class, Transitive closure.
(9)	Let X={1,2,3,4,5,6,7} and R=$\{(x,y); x - y \text{ is divisible by } 3\}$. Show that R is an equivalence relation. Draw the graph of R.
(10)	Let X={1,2,3,4,5,6,7} and R=$\{(x,y); x - y \text{ is even}\}$. Show that R is an equivalence relation.
(11)	Define with examples: Partial ordered relation, Partial ordered set, Totally ordered set.
(12)	If A is the set of all points in a plane, the relation 'at the same distance from the origin as' is an equivalence relation.
(13)	Find the transitive closure of R by Warshall's algorithm. where $A = \{1,2,3,4,5,6\}$ and R=$\{(x-y): \lvert x - y \rvert = 2\}$.
(14)	Give a relation which is both a partial ordered relation and equivalence relation on a set.
(15)	Draw the digraph for the following relation and determine whether the relation is reflexive, symmetric, transitive and antisymmetric. A={1,2,3,4,5,6,7,8} and let xRy whenever y is divisible by x.
(16)	Let R be the relation on set A. A={5,6,8,10,28,36,48}. Let R=$\{(x,y); x \text{ is divisior of } y\}$. Draw the Hasse diagram.
(17)	Define with examples: Hasse diagram and Lattice.
(18)	Draw the Hasse diagram of the following sets under the partial ordering relation 'divides' and indicate those which are chains:(1){2,4,12,24} (2){1,3,5,15,30}.
(19)	Let A be set of factor of positive integer m and relation is divisibility on A.i.e. R=$\{(x,y); x,y \in A, x \text{ divides } y\}$. For m=45 show that poset $(A,\leq)$ is lattice. Draw the Hasse diagram and give join and meet for the lattice.
(20)	$A = \{2,3,4,6,8,12,24,36\}$ is a Poset $(A,\leq)$.