

School of Distance Education

University of Kerala

M.Sc Computer Science

Assignment Topics 2017-2018

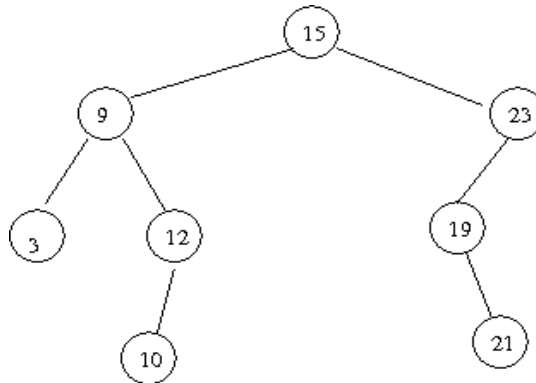
DCS11 Computer Architecture

1. Explain the following terms

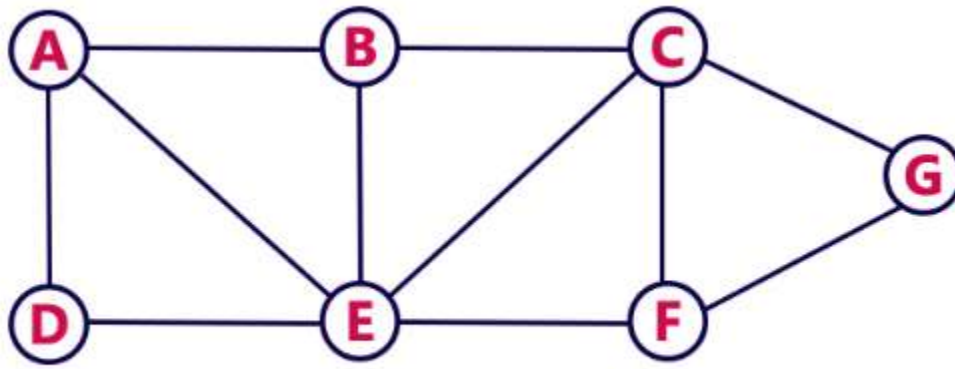
- a) Memory Organization
- b) Memory system considerations
- c) Cache memory
- d) Virtual memory
- e) Shared Memory
- f) Distributed Memory- PRAM model of parallel computation.

DCS 12 Data structures and Algorithms

1. List the nodes of the below tree in preorder, post order and inorder



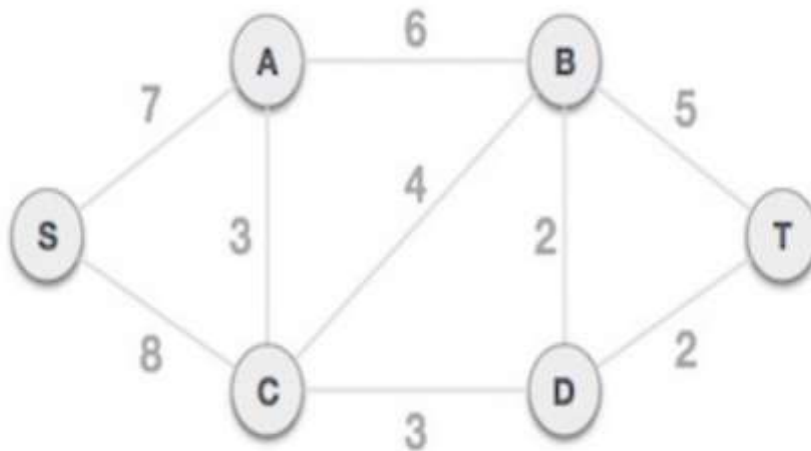
- 2. In the above binary search tree, carry out the following operations in sequence:
Add 5, add 17, delete 23, and delete 9.
- 3. With example write short notes on B-Tree and B+ Trees



a. Represent the above graph in adjacency list and adjacency matrix representation

b. Perform DFS and BFS traversals on the above graph

4. Consider the following graph. Perform minimum cost spanning tree algorithms



on it.

5. Apply Quick Sort Algorithm with the following example. Explain step by step procedure

22, 34, 14, 30, 8, 16, 45, 2, 9, 24

6. Explain randomized version of quick sort

7. Write short notes on NP hard and NP Complete problems.

8. Write an example for matrix chain multiplication using dynamic programming.

DCS13 Mathematical Foundations of Computer Science

1) A Survey of 500 television watchers produced the following information: 285 watch football games, 195 watch hockey game, 115 watch basket ball games, 45 watch football and basket ball games, 70 watch football and hockey games, 50 watch hockey and basket ball games, and 50 do not watch any of the three kind of game.

a) How many people in the survey watch all three kinds of games.

b) How many people watch exactly one of the sports.

2) Give out the first four terms of (begin with $n=1$) of the sequence whose general term is given.

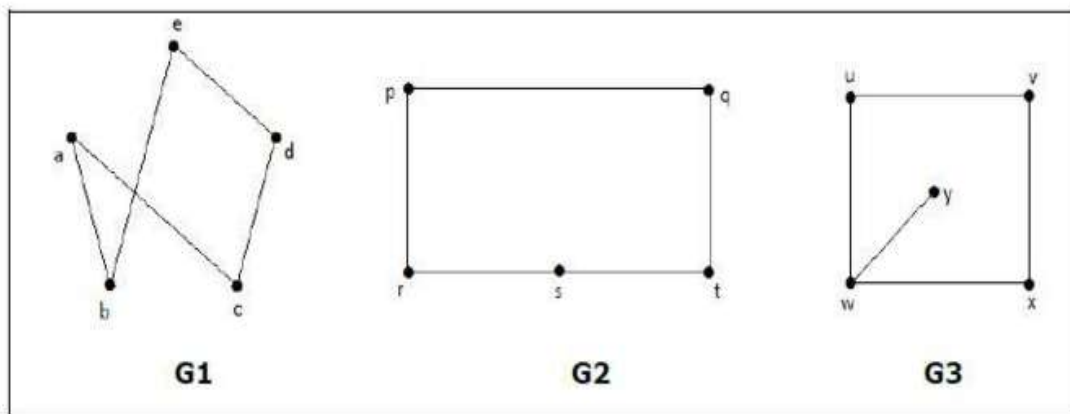
a) $a_n = 5^n$ b) $b_n = 3n^2 + 2n - 6$ c) $c_1 = 2.5$ $c_n = c_{n-1} + 1.5$

3) Prove or disprove that if a relation R on A is transitive, then R^2 is also transitive.

4) Show that $f: X \rightarrow Y$ is one-to-one iff any proper subsets of X are mapped into proper subsets of Y .

5) Show that the symmetric difference Δ defined by $A \Delta B = (A \cup B) - (A \cap B)$ is commutative and associative and has an identity element. Show that the inverse of A is A itself. Show that the operation of intersection, but not that of union, distributes over Δ .

6) Which of the following graphs are isomorphic? Why?



7. Prove that the given graph G is Euler graph if and only if all vertices of G are of even degree

8. Draw an example for Euler graph

9. Draw a graph with Hamiltonian circuit and without Hamiltonian circuit

10. Explain minimal spanning tree algorithms with example
11. Explain finite state machine languages
12. Prove that Any two cyclic groups G and H of the same order are isomorphic with example
13. Let $A = \{a, b, c, d, e, f, g\}$. Compute the products.
 (a) $(a, f, g) \circ (b, c, d, e)$ (b) $(f, g) \circ (b, c, f) \circ (a, b, c)$
14. Show that there are 15 partitions of a set of four elements. Draw the diagram of the corresponding lattice.
15. Show that the operations of meet and join on a lattice are commutative, associative and idempotent
16. Consider the statement “given any positive integer, there is a greater positive integer”. Symbolize this statement with or without using the set of positive integers as the universe of discourse.
17. Which of the following are statements?
 i) $(x) (P(x) \vee Q(x)) \wedge R$
 ii) $(x) (P(x) \wedge Q(x)) \wedge (\exists(x)) S(x)$
18. Indicate the variables that are free and bound. Also show the scope of the quantifiers.
 a) $(x) (P(x) \wedge R(x)) \rightarrow (x) P(x) \wedge Q(x)$
 b) $(x) (P(x) \wedge (\exists(x)) Q(x) \vee ((x) P(x) \rightarrow Q(x)))$
19. Find the truth values of $(x) (P(x) \vee Q(x))$, where $P(x): x = 1, Q(x): x = 2$, and the universe of discourse is $\{1, 2\}$.

DCS14 Programming Paradigms

1. Define the different programming paradigms
2. Give the significance of constructors and friend functions in C++. Explain with example
3. What are Packages? Write a program in Java to create a package and add the package to the program
4. How concurrent programming is possible in Java?
5. Why Java is used in Internet applications
6. What are Applets ? Write an applet program to draw a human face
7. Define layout managers. Write a Java program that uses anyone of the layout manager to arrange its components.

8. Define RMI.
9. Write a program in Java to copy the contents of one file to another one.
10. Why scripting languages are useful in Internet. Write a JavaScript program to perform calculator operations ?
11. Explain the Servlet architecture
12. Write a style sheet to improve the appearance of the contents using XSLT
13. Write an RMI program to perform communication between client and server
14. Write an applet program to perform calculator operations
15. Compare the features of Java to C++

DCS15 Computer Networks

1. What do you meant by telecommunication System ?
2. Explain the following terms.
 - a) GSM
 - b) DECT
 - c) TETRA
 - d) UMTS
 - e) IMT-2000