615117

MCA Sem-II (Choice-Based) (72)

Data structure Q.P. Code :06213

[Time: 3 Hours] [Marks:80]

Please check whether you have got the right question paper.

N.B:
- Questions 1 are compulsory.
- Answer any 3 form the remaining 5 questions.
- Provide illustrations wherever required.

Q.1) a) What is a queue? Explain the working of an ordinary queue and write algorithms to. 10
i) Insert an element in the queue.
ii) Delete an element form the queue.

b) Given a set of symbols and corresponding frequency table as below, explain the step to find the Huffman code for each character. 10

Symbol	A	B	C	D	E	F	G	H	I
Frequency	10	3	4	2	4	2	3	6	8

Q.2 a) Define and explain the working of the stack data structure. Give algorithms for the Push Pop, Stack Full, Peek and stack Empty functions. 10

b) What is a heap? Give the algorithm for Reheap Up. 10
Construct a Max Heap for the following data values arriving in sequence 12,3,10,14,58,26,18,2,91,3.

Q.3 a) What is a Binary Search Tree? Write the algorithms to 10
i) Find the maximum value in a BST
ii) Search for an element in a BST

b) What is sorting? Sort the following elements using Selection Sort method 14, 6, 4, 8, 11, 12, 10, 13.Also give the algorithm for the same. 10

Q.4 a) Explain the circular linked list. For a circular linked list write algorithms to 10
i) Find the numbers of element in the list.
ii) Delete an element in the list.

b) Define hashing .Explain the terms synonyms, collision and home address. Using modulo division and linear probing method, store the keys given below in an array of 13 elements. How many collisions occurred? 10

28	7	846
786	431	870
612	675	870
546	34	12

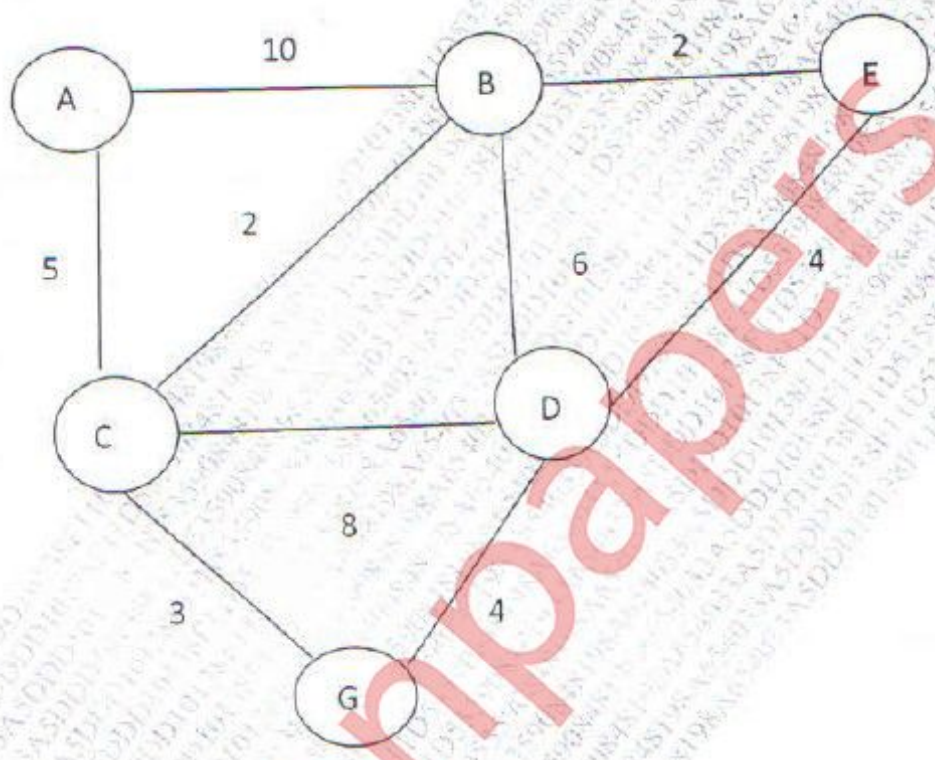
[P.T.O]

Q.5 a) Differentiate between 10

i) Singly Linked List and Doubly Linked List

ii) Linear and Binary search

b) What is a network? Explain the shortest path problem. Apply Dijkstra's algorithm and find the shortest path from node A. 10



Q.6 a) Write short notes on 10

i) Analysis of an algorithm

ii) Backtracking Divide and Conquer techniques

b) What is a multiway tree? How is the B Tree an improvement over the multiway tree? Construct a B Tree of order 3 for the following data value arriving in sequence: 92,24,6,7,11,8,22,4,5,16,19,20,78 10
