

Total No. of Questions : 12]

SEAT No. :

P647

[Total No. of Pages : 3

[4457] - 125

S.E. (Information Technology) (Semester - II)

DATA STRUCTURES & FILES

(2008 Course)

Time : 3 Hours]

[Max. Marks :100

Instructions to the candidates:

- 1) *Answer Question Nos. 1 or 2, 3 or 4, 5 or 6 from Section - I and question Nos. 7 or 8, 9 or 10 and 11 or 12 from Section - II.*
- 2) *Answers to the two sections should be written in separate answer books.*
- 3) *Neat diagrams must be drawn whenever necessary.*
- 4) *Figures to the right indicate full marks.*
- 5) *Use of logarithmic tables, slide rule, Mollier charts, electronic pocket calculator and steam tables is allowed.*
- 6) *Assume suitable data, if necessary.*

SECTION - I

- Q1)** a) What is command Line argument? Write a program to accept a Source File Name, Destination File Name and an integer value known as “offset value” using command line arguments. The program then reads the Source File starting from the location specified by the offset value and writes into the Destination File and Display the Destination File to the user. **[10]**
- b) Explain the primitive operations performed on File. **[4]**
- c) Explain different modes of opening files. **[4]**

OR

- Q2)** a) What is Hashing? Explain chaining with and without replacement as a collision resolution technique for hashing with examples. **[10]**
- b) Write a C program to create a Direct Access file and insert records in the file. Display all records and search for a specific record entered by user. **[8]**
- Q3)** a) What is stack? Implement push and pop operations for stack using linked organisation. **[8]**
- b) Write Pseudo algorithm to convert an infix expression to prefix expression and convert the following: **[8]**
- $2 * 3 / (2 - 1) + 5 * (4 - 1)$

OR

P.T.O.

- Q4)** a) Clearly indicate the contents of stack during conversion of given infix expression to postfix expression: $((A / (B * C)) + (D * E)) - (A * C)$ [8]
 b) Implement stack as an ADT using sequential organisation. [8]
- Q5)** a) Given a queue of integer's q1, write a program using the Queue ADT that copies the content of queue q1 to another queue q2 and then it prints the sum of all positive integers from the queue q2. [8]
 b) Write short notes on : [8]
 i) Double ended queue
 ii) Priority queue.

OR

- Q6)** a) Consider a circular queue of characters and is of size 6. “-” denotes an empty queue location. Show the queue contents as the following operations are performed: [8]
 i) F is added to the queue ii) Two letters are deleted
 iii) K, L and M are added to the queue iv) Two letters are deleted
 v) S is added to the queue vi) One letter is deleted
 vii) R is added to the queue viii) One letter is deleted.
 Initial queue configuration is :
 FRONT = 2, REAR = 4,
 Queue Content: -, X, Y, Z, -, -
- b) How do you represent a queue in computer's memory? Write a pseudo code to insert and delete an element in queue. [8]

SECTION - II

- Q7)** a) Construct a binary tree from following traversals: [8]
 Post Order: H D I E B J F K L G C A
 Inorder: H D B I E A F J C K G L
 Write a pseudo code to display the preorder of the constructed binary tree.
- b) What are the advantages of threaded binary tree over normal binary tree? Write a pseudo code for insertion and deletion of element in a Threaded Binary Tree. [8]

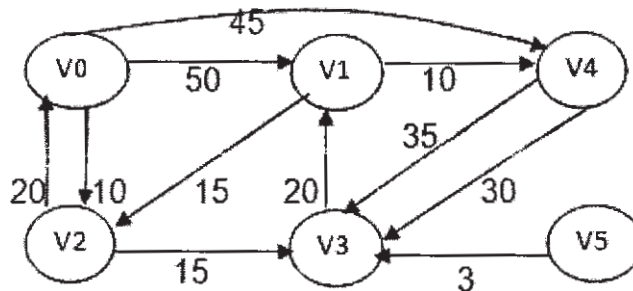
OR

- Q8) a)** Draw the BST for the given set of data values, JAN, FEB, MAR, APR, MAY, JUN, JULY, AUG, SEP, OCT, NOV, DEC. Write a pseudo code to delete a rightmost node from a BST. [8]
- b)** Define the following terms with respect to trees : [8]
- Complete Binary Tree
 - Predecessor and Successor
 - Forest
 - OBST.

- Q9) a)** What is Graph Traversal? Differentiate between BFS and DFS with suitable examples. [8]
- b)** What is Spanning Tree? Write a pseudo code to find out minimum spanning tree of a graph using Prim's algorithm. [8]

OR

- Q10)a)** Write pseudo code to find the shortest path in weighted graph. Find the shortest path in the following graph from node V0 to node V1 and node V4. [10]



- b)** Define the following terms with respect to graphs : [6]
- Multi graph
 - Connected graph
 - Adjacency Multilist
- Q11)a)** What is need of height balanced tree? Write a Pseudo code for LL, RR, LR and RL rotations for AVL tree. [10]
- b)** Explain static and dynamic tree tables. [8]

OR

- Q12)a)** Define Max Heap. Write Pseudo 'C' code for the following operations on Max Heap: [10]
- Insertion of element in Max Heap
 - Deletion of an element from Max Heap.
- What is time complexity of each operation.
- b)** Explain the mechanism to create Huffman's tree and use it for encoding and decoding the data. Assume suitable data. [8]

