Total No. of Questions : 8]

SEAT No. :

PE4269

[Total No. of Pages : 2

[6582]-41

S.E. (Computer Engineering) (AI & DS)

FUNDAMENTALS OF DATA STRUCTURES

(2019 Pattern) (Semester - III) (210242)

Time : 2½ Hours] *[Max. Marks : 70*

Instructions to the candidates:

1) ***Answer to the questions (Q.No. 1 or Q.No. 2, Q.No. 3 or Q.No. 4, Q.No. 5 or Q.No. 6, Q.No. 7 or Q.No. 8.)***
2) ***Assume suitable data, if necessary.***
3) ***Draw neat labelled diagram wherever necessary.***
4) ***Figures to the right indicate full marks.***

Q1) a) Given numbers 49, 47, 37, 29, 26, 10, 65, 78, 21, 49. Sort stepwise using radix sort. When it is appropriate to use radix sort? Write time Complexity. **[9]**

b) Write pseudocode/Function for Binary Search algorithm. Explain with suitable example. **[9]**

OR

Q2) a) Write short note on **[9]**

i) Binary Search

ii) Index sequential search

iii) Linear Search

b) Explain Quick sort technique with suitable solved example. Comment on time complexity. **[9]**

Q3) a) Write pseudo code/function using Doubly Linked List of Employees (Emp-number, name and age stored in every node) for: **[9]**

i) Search given Emp_no and update the age

ii) Add given Emp_no after specified number in the list

b) Write and explain use of Generalized linked list for representation of multivariable polynomial with suitable example. Explain node structure. **[9]**

OR

Q4) a) How polynomial can be represented using Singly Linked List?
Write pseudocode to perform addition of two polynomials using singly linked lists into third list. **[9]**

b) Draw and explain structure of Circular Doubly Linked List.
What are advantages of Circular Linked List over Singly Linked List?
Write pseudocode/function for insertion of a node in Circular doubly linked lists. **[9]**

P.T.O.

Q5) a) What are the rules to convert infix expression to postfix expression using stack. Convert expression (E* (F– (G + H * I)) ^ (J * K + L)) stepwise using above rules.

Where ^ is - exponential operator **[8]**

b) Write short notes on **[9]**

i) Backtracking

ii) Tree Recursion

iii) Tail recursion.

OR

Q6) a) What are polish notations? What is the need to convert infix expression into postfix form? Explain postfix evaluation with suitable example. **[8]**

b) Write pseudo-C/C++ code to implement stack using Singly linked list with overflow and underflow conditions. **[9]**

Q7) a) Write short notes on: **[8]**

i) Comparison of Linear queue and Circular queue

ii) Priority queue

b) What is Doubly Ended Queue? Which two data structures are combined in it? Explain input restricted and output restricted queue with operations. **[9]**

OR

Q8) a) Write short note on: **[8]**

i) Circular Queue using Singly Linked List

ii) Descending priority queue and it's applications

b) Draw and explain implementation of Doubly ended Queue using Doubly Linked List. Explain Add, Remove operations. **[9]**