Total No. of Questions : 8]

SEAT No. :

P-9671

[Total No. of Pages : 2

[6179]-241

S.E. (Computer Engineering A.I & D.S.)

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) Sort the following numbers step by step using insertion sort : [9]
55, 85, 45, 11, 34, 5, 89, 99, 67
Comment on time complexity of Insertion sort

b) Explain in brief any three searching techniques. What is the time complexity of these techniques? [9]

OR

Q2) a) Explain Fibonacci Search algorithm with suitable example. What is it's time complexity? [9]

b) Given numbers 29, 57, 47, 39, 36, 20, 55, 28, 31, 39. Sort stepwise using radix sort. When it is appropriate to use radix sort? Write time Complexity. [9]

Q3) a) Write pseudo code for following function using Singly Linked List of students (roll_number and name stored in every node) [9]

i) Search given roll no and delete that record, Draw diagram of operation.

ii) Add given number after specified number in the list. Draw diagram of operation.

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

P.T.O.

OR

Q4) a) Write pseudocode to perform addition of two polynomials using doubly linked lists into third list. Write time complexity of it. **[9]**

b) Write and explain node structure of Circular Singly Linked List and Doubly Linked list. Write pseudocode for concatenation of two doubly linked lists. **[9]**

Q5) a) Write rules to convert given infix expression to postfix expression using stack. Convert expression (P * Q – (L + M * N) ^ (X * Y / Z)) stepwise using above rules.

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

b) Explain with example three different types of recursion. **[9]**

OR

Q6) a) Explain procedure to convert infix expression to prefix expression and 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) Draw and explain Circular queue using array. Write pseudocode for Add, Remove operations. **[8]**

b) What is Doubly Ended Queue? Draw Dragram with labelling four basic operations at appropriate places. Which two data structures are combined in it and how? **[9]**

OR

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

i) Comparison of Circular Queue with Linear queue

ii) Priority Queue

b) Draw and explain implementation of Linear Queue using Singly Linked List. Explain Add, Remove, Queue Full and Queue Empty operations. **[9]**