

Total No. of Questions – [08]

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G.R. No.

Paper Code - U218-144 (BE-FF)

MAY 2019/ENDSEM

S. Y. B. TECH. (I.T.) (SEMESTER - I)

COURSE NAME: FUNDAMENTALS OF DATA STRUCTURES

COURSE CODE: ITUA21174

(PATTERN 2017)

Time: [2 Hours]

[Max. Marks: 50]

(*) Instructions to candidates:

- 1) Answer Q.1, Q.2, Q.3, Q.4, Q.5 OR Q.6, Q.7 OR Q.8
- 2) Figures to the right indicate full marks.
- 3) Use of scientific calculator is allowed
- 4) Use suitable data where ever required
- 5) Write suitable examples wherever necessary.
- 6) Draw suitable diagrams if required.

Q-1 a) Explain array of pointers and pointer to array with example. [6 marks]

OR

b) Describe the following statements. [6 marks]
i) `int a, *b=&a` ii) `int p, *q` iii) `a= (float*) &x` iv) `int **q`
v) `char *s` vi) `int (*p)++`

Q-2 a) Explain static and dynamic data structure with suitable example. [6 marks]

OR

b) Explain asymptotic notations. [6 marks]

Q-3 a) Sort the following values in descending order using merge sort. (Show passes) [6 marks]
18,20,16,13,5,25,86, 77,12,25,24,26

OR

b) Compare selection sort and insertion sort. Comment on their complexity. [6 marks]

Q-4 a) Represent the following polynomials using arrays [4 marks]

- a. $x^4 - 75x^3y^2 + 2y - x$
- b. $2x^6 + 10x^4y^2 - 3xy^2 + 10x$

OR

b) Explain 2-D array in detail with column and row major [4 marks]

representation. Explain address calculation in both cases.

- Q-5 a) Describe different types of linked list. [6 marks]
b) What is dynamic data structure? List the advantage of linked lists. [4 marks]
c) Give node structure to represent multivariable polynomial using GLL. Explain with example. [4 marks]

OR

- Q-6 a) Write pseudo C function to insert a node before and after any node in doubly linked list and for deletion of a specified node. Give example. [6 marks]
b) Write a C function to search a node in a singly linked list. [4 marks]
c) Give the structure definition to represent doubly linked list to store numbers. Compare doubly linked list with singly linked list. [4 marks]

- Q-7 a) Convert infix to postfix. Show stack contents. [6 marks]
 $(A-2)*(B+C-D*E)*F$
b) Explain the drawbacks of linear queue and how drawbacks can be removed? [4 marks]
c) Compare stack and queue with suitable example. [4 marks]

OR

- Q-8 a) Write Pseudo 'C' function to insert and delete item in Queue. [6 marks]
b) Write algorithms to evaluate prefix and postfix expression. [4 marks]
c) Evaluate the following expression postfix using stack: [4 marks]
 $623+-382/+*2^$