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G.R. No.	

Paper Code – U218-144 (BE-FS)

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 any three functions used for file handling in C with syntax and example. [6marks]

OR

b) Describe the following declarations: [6marks]

1. int *A[10];
2. int (*f)(int a[10], int n);
3. FILE *fp;

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

OR

b) Justify the need to measure performance of algorithm. Explain the methods to measure the performance of algorithm. [6marks]

Q-3 a) Sort the following values in descending order using selection sort. Write pseudo code for the same. [6 marks]
SUN, MON, TUE, WED, THURS, FRI, SAT

OR

b) Explain Quick sort algorithm with example. Comment on its complexity. [6 marks]

Q-4 a) Explain Memory representation and address calculation for a 1-D [4 marks]

and a 2-D array with suitable example for each.

OR

b) Write a C code for fast transpose of a sparse matrix and write its complexity. [4 marks]

Q-5 a) Compare the linked and sequential organization of data structure. [6 marks]

b) Write a function in C for inserting element 7 in the given sorted linked list 1->2->3->4->5. [4 marks]

c) Give node structure of circular linked list. Compare SLL and CLL. [4 marks]

OR

Q-6 a) Write a C function that creates a new linked list by selecting alternate elements of given singly linked list. Give example. [6 marks]

b) Write a recursive function in 'C' to count all the nodes in doubly linked list. [4 mark

c) Explain linked list as ADT. [4 marks]

Q-7 a) Convert infix to prefix. Show stack contents. [6 marks]
(A+B)*C-D*F+C

b) Write and explain any 2 applications of queue with example. [4 marks]

c) Differentiate stack and queue data structure. [4 marks]

OR

Q-8 a) Write a C function for push and pop operation of stack using array. [6 marks]

b) For a doubly ended queue: __, ___, ___, 10, 11, 12, 13, __, ___, ___. [4 marks]
Front=3 rear=6
What will be the output after operations:
Enque_front(9);
Enque_rear(14);
Enque_rear(15);
Deque_front();
Deque_front();
Enque_rear(18);

c) Write algorithm to convert infix to postfix expression. [4 marks]