Total No. of Questions – [06] Total No. of Printed Pages: 2

G.R. No.	

DECEMBER 2021-ENDSEM EXAM

S. Y. B. TECH. (COMPUTER ENGINEERING) (SEMESTER - I)

COURSE NAME: FUNDAMENTALS OF DATA STRUCTURE

COURSE CODE: CSUA21204

(PATTERN 2020)

Time: [1 Hr] [Max. Marks: 30]

Instructions to candidates:

1) **Answer Q.1 OR Q.2, Q.3 OR Q.4, Q.5 OR Q.6.**
2) **Figures to the right indicate full marks.**
3) **Use of scientific calculator is allowed**
4) **Use suitable data where ever required**

Q.1 a	Identify the data structure used in recursion? Justify your answer.	[4]
Q.1 b	Apply the concept of stack for reversing the given string. Write Pseudo code for the same.	[6]
	OR	
Q2 a	Evaluate the given postfix expression 8 3 3 + - 3 6 2 / + * 2 ^ . Show step wise contents of stack.	[4]
Q2 b	Illustrate stepwise stack contents for converting the following infix notation to postfix notation. ((8-(3+3)) * (3+(6/2))^2. Support your answer with appropriate pseudo code.	[6]
Q.3 a	Compare Stacks and Queues	[4]
Q.3 b	A linear queue using array has a size of 3. Perform the following operations on this queue and show sequence of steps with necessary diagrams indicating values of front, rear and contents of queue: i) insert 10 ii) insert 20 iii) insert 30 iv) delete an element v) insert 40 vi) delete an element vii) delete an element	[6]

viii) insert 50

OR

Q.4 a	Explain: how Priority Queue helps in operating system?	[4]
Q.4 b	Implement the following functions in 'C++' to implement circular queue using array: (i) Insert an element, (ii) Delete an element, (iii) Queue full, (iv) Queue empty. Assume data elements to be integer	[6]
Q.5 a	Compare the selection sort and insertion sort with respective to: (i) Time complexity (ii) Passes (iii) Storage requirement (iv) Sort stability.	[4]
Q.5 b	Sort the following data in ascending order using Quick sort. Show all passes with pivot: 56, 12, 84, 28, 0, -13, 47, 94, 31.	[6]

OR

Q.6 a	Discuss and compare the internal and external sorting by taking suitable example of each type.	[4]
Q.6 b	Explain the comparisons done by binary search algorithm in order to search 28, 12, 29, 9 in given input. (Arrange the input as required) Input Array: 40, 21, 80, 54, 2, 11, 55, 95, 32, 12, 9, 15, 55, 30.	[6]