University Institute of Engineering & Technology

(Recognised Under Section 2(f) and 12B of UGC)

Kurukshetra University, Kurukshetra

THEORY EXAMINATION – JULY 2021	
B.TECH - ECE	**SEMESTER – IV**

TIME – 4 Hrs.

M.M. - 75

PAPER - ECE-202	**SUBJECT - Data Structures and Algorithms**

INSTRUCTIONS TO BE FOLLOWED

- **The candidates will be required to attempt All questions in Part-A and Part-B (Compulsory Sections). Attempt any four questions from Part-C selecting at least one from each unit.**
- **Allotted time for examination is 4 hours that includes time for downloading the question paper, writing answers, scanning of answer sheets and uploading the sheets on the Attendance Sheet Cum Answer Sheet Uploading google form.**
- **The PDF files should be saved as Roll No. and Subject Code.**
- **Maximum Page Limit should be 36 (Thirty Six) for attempting the question paper on A4 sheets which could be downloaded and printed from the sample sheets given in the UIET Website.**
- **Over-attemptation should be avoided.**
- **Handwriting should be neat and clean and diagrams should be clear and contrasted.**
- **The candidate should not write their Mobile No. otherwise Unfair Means Case will be made.**
- **While attempting the paper, the candidate will use blue/black pen only.**
- **Before attempting the paper, the candidate will ensure that he/she has downloaded the correct question paper. No complaint for attempting wrong question paper by the candidate will be entertained.**
- **Candidate must ensure that he/she has put his/her signature on each page of the answer sheet used by him/her. Answer sheet without the signature of the candidate will not be evaluated.**
- **Attempt parts A, B & C separately. Do not inter-mix them. Write neatly & mention the question number clearly.**

PART-A (15 Marks)

Q. No. – 1 Answer the following questions. 15x1=15

(i)	Declare and initialize JEE (MAIN) rank of all students of your class.
(ii)	Declare and initialize home city of all students of your class.
(iii)	Declare and initialize matrix of order 2x3.
(iv)	Declare and initialize your birth date.
(v)	List the keywords of 'C' language.
(vi)	List 10 valid identifiers in 'C'.
(vii)	The postfix notation of (A*(B-C)) + (D/(E-F)) ?
(viii)	The output after 3rd pass of bubble sort in ascending order of 19,2,12,10,18,14,4,71,11 is
(ix)	Output of C statement i = 4 < 5 ?10:50
(x)	Write the enum declaration for day of the week.
(xi)	Evaluate the postfix expression ab^c/d*e- where a = 2, b = 3, c = d = 2, e = 10
(xii)	Differentiate between an uninitialized pointer and a NULL pointer.
(xiii)	Define struct Node for doubly linked list.
(xiv)	Describe Complete binary tree.
(xv)	Differentiate between directed and undirected graph.

PART-B (20 Marks)

	UNIT-I	
2	Explain and differentiate between break and exit statements of C language with example.	5
	UNIT-II	
3	Explain Push and Pop operation on Stack.	5
	UNIT-III	
4	Explain the operations Insertion after a node in a linked list.	5
	UNIT-IV	
5	Explain array representation of 15 Node binary tree with example.	5

PART-C (40 Marks)

	UNIT-I	
6	Write a program in C to calculate factorial of N using recursion.	10
7	Explain concept of data structure and steps involved to develop an algorithm.	10

	UNIT-II	
8	Explain Bubble sort algorithm in detail with the help of suitable example of 10 elements.	10
9	Use a stack to evaluate the following postfix expression. Show the changing status of the stack in tabular form. Q = XYZP^*+AB/C+- for X = 2, Y = 1, Z = 3, P = 2, A = 10, B = 5, C = 6.	10
	UNIT-III	
10	Explain Pointer variables in C and how they are stored in memory. Discuss '&' and '*' Operators of pointer variables.	10
11	Write the algorithms for Creation of linked list and deletion of a node in a linked list.	10
	UNIT-IV	
12	Explain the binary trees and its various types. Discuss in detail the linked list representation of a binary tree.	10
13	Describe array based and linked list based representation of Graphs. Also list advantages and disadvantages of both representations.	10