CBCS SCHEME

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18CS32

Third Semester B.E. Degree Examination, Aug./Sept.2020
Data Structures and Applications

Time: 3 hrs. Max. Marks: 100

Note: *Answer any FIVE full questions, choosing ONE full question from each module.*

Module-1

1 a. Define data structures. List and explain the different operations that can be carried on arrays. **(10 Marks)**

b. Define pointers. List the advantages of pointers over arrays. **(04 Marks)**

c. Define dynamic memory allocation. List and write with explanation the syntax of dynamic memory allocating functions. **(06 Marks)**

OR

2 a. Define strings. List and explain any 5 operations with example. **(12 Marks)**

b. Is it possible to store the contents of an array into a points? Justify your opinion and with suitable C-statements. **(08 Marks)**

Module-2

3 a. Define a stack. Explain the different operation that can be performed on stack using C-functions and show them using diagrammatic representations. **(10 Marks)**

b. Write an algorithm to convert a parenthesized infix expression to postfix. Apply the algorithm and show the contents of stack during conversion for the expression : $(A + B * C) * ((D + E - F)/J)$. **(07 Marks)**

c. Differentiate recursion and iteration process. **(03 Marks)**

OR

4 a. Write a C–recursive function for
i) Adding n-odd natural numbers
ii) Adding n-even natural numbers. **(08 Marks)**

b. Define a queue. List the different types of queues. State the limitation of ordinary queue. Explain how do you overcome the limitation by specifying the required C-statements and diagrammatic representation using an example. **(12 Marks)**

Module-3

5 a. With the C–statements, explain how do you create a node, add and delete on Singly Linked List (SLL) with proper message where each node is containing the details of employee in the form of EmpId, EmpName, Empaddr and Empsalary as data fields. **(10 Marks)**

b. Write and explain how do you implement the operations of stack using Singly Linked List (SLL) with the help of C–statements. **(10 Marks)**

OR

6 a. Differentiate Single (SLL) and Doubly (DLL) linked lists. **(04 Marks)**

b. State the advantage of Doubly Linked List over Singly Linked List. **(02 Marks)**

c. Implement addition and deletion of a NODE on a Doubly Linked List (DLL) with required C–statements. **(14 Marks)**