Question Paper Code : 20357

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2018.

Second Semester

Computer Science and Engineering

CS 6202 — PROGRAMMING AND DATA STRUCTURES — I

(Common to Information Technology)

(Regulations 2013)

(Also Common to PTCS 6202 – Programming and Data Structures I
for B.E. (Part-Time) First Semester-Computer Science and
Engineering - Regulations 2014)

Time : Three hours   Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What is a pointer? Give an example for pointer declaration and initialization.

2. Define a function to swap two integer numbers.

3. Differentiate structure and union.

4. List atleast four functions used in C language to open, process and close a file.

5. How an ADT differs from regular data type?

6. What is a linked list? Illustrate with a diagram.

7. Define a stack and outline the operations that can be performed on a stack.

8. What are the advantages of double ended queues?

9. Outline the differences between merge sort and quick sort., w.r.t time complexities.

10. How hasting is performed using open chaining?

PART B — (5 × 16 = 80 marks)

11. (a) Write a C program using function(s) to accept two matrices, check whether the dimensions of both the matrices match, perform matrix addition and print the result. (16)

Or

(b) (i) Write a C program using function(s) to accept an array of 'n' numbers, sort the numbers in ascending order and display the result. (9)

(ii) Explain preprocessor directives in detail. (7)

12. (a) (i) Write a C program to perform the following : Create a structure employee with variables eno, name, designation, basic pay and allowance. The data type of eno is integer, name and designation is character, basic pay and allowance are integers. Your program should accept the above details for an employee and display the same. (6)

(ii) Give an example for structures defined within another structure in C. Illustrate with the necessary declarations and programs. (4)

(iii) Write a function search to retrieve and display a particular employee with their details. (6)

Or

(b) Write a 'C' program to read two file contents and displays the mismatching words present in the two files. (16)

13. (a) Explain deletion a node from a linked list with suitable diagrams. Explain create, insert and delete operations in circular list. (16)

Or

(b) (i) What are the advantages of circular linked list? (6)

(ii) How a polynomial is represented using linked list? Explain with an example. (10)

14. (a) Write the necessary routines for postfix expression evaluation using stack ADT. Trace your algorithm with an example. (16)

Or

(b) What is a queue data structure? Illustrate with a diagram and explain the algorithm for inserting data into a queue and deleting data from a queue. (16)

15. (a) (i) Write the selection sort algorithm and apply the selection sort algorithm for the following data set : 44, 68, 191, 119, 37 and 83. (7)

(ii) Explain quick sort with an example. (9)

Or

(b) (i) Outline the steps to perform binary search on a sorted array of 'N' numbers. Write the algorithm. Trace your algorithm with an example. (9)

(ii) What is separate chaining? Write necessary routines for collision resolution using separate chaining. (7)