Reg. No. : E N G G T R E E . C O M

Question Paper Code : 30119

B.E./B.Tech DEGREE EXAMINATIONS, APRIL/MAY 2023.

Third Semester

Electrical And Electronics Engineering

CS 3353 – C PROGRAMMING AND DATA STRUCTURES

(Common to: Electronics and Communication Engineering/Electronics and Instrumentation Engineering/Electronics and Telecommunication Engineering/Instrumentation and Control Engineering)

(Regulations 2021)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What is the role of associativity in prioritizing the operators?

2. Define recursion.

3. Write short notes on 'enum'.

4. What is the role of pointers in call by reference.

5. List the advantages of linked list over arrays.

6. Name any four applications of queue in the field of computer applications.

7. Convert the infix expression to postfix : $(A - B / C) * (D / E - F)$

8. What is rehashing? When is it Preferred?

9. What is output of selection sort after second iteration for the number sequence: 15, 5, 43, 7, 25, 11

10. Is linear search is better than binary search? Why?

PART B — (5 × 13 = 65 marks)

11. (a) What is the use of looping? Explain about the entry - controlled and exit-controlled loops available in 'C' with appropriate sample C programs (13)

Or

(b) What is an array? List the various types of arrays. Elaborate on t – D array with an example. (13)

12. (a) (i) What is the significance of 'structure' in language C? Explain in detail with an example program. (10)

(ii) Enumerate the difference between structures and unions. (3)

Or

(b) (i) Explain the procedure to pass an array as argument to a function with an example program. (7)

(ii) Write brief notes on preprocessor directives. (6)

13. (a) (i) Write and explain the algorithms of enqueue and dequeue operations of queue. (7)

(ii) Write short notes on doubly linked list with few operations. (6)

Or

(b) (i) Write and explain the algorithms of peek and display operations of stack. (7)

(ii) With appropriate diagram explain any one application of queue. (6)

14. (a) (i) What is tree traversal? Explain various methods of traversals. (7)

(ii) Construct an expression tree for the expression $(p + r * q) + ((s * t + u) * v)$. What would be the output if inorder, preporder and postorder traversals are done. (6)

Or

(b) (i) What is a hash function? Explain the concept of hashing with example. (7)

(ii) Construct BST for the following: $\{20, 30, 10, 40, 50, -20, -30, 60\}$ (6)

15. (a) (i) Sort the following values using quick sort:

35,40,45,50,55,30,25,20,15 (9)

Illustrate each step of the sorting process.

(ii) Write and explain the algorithm of linear search. (4)

Or

(b) (i) Explain about the sorting algorithm that works based on divide and conquer technique. (7)

(ii) What are the advantages of linear search over binary search? Justify your observation with an example. (6)

PART C — (1 × 15 = 15 marks)

16. (a) (i) Convert the following arithmetic expression in infix form to post fix form using stack: $A + B / C + D * (E - F)$ ^ G (8)

(ii) Explain the procedure for string reversal using stack with suitable diagram. (7)

Or

(b) (i) Evaluate the following arithmetic expression using stack. 2*(4+3)−5 (8)

(ii) Explain the procedure for balanced parenthesis checker using stack with suitable diagram. (7)