

B.C.A. (Part—II) Semester—III Examination

3ST1 : DATA STRUCTURE

Time : Three Hours]

[Maximum Marks : 60

Note :—(1) All questions carry equal marks.

(2) Assume suitable data wherever required.

(3) Draw neat sketches, if required.

1. (a) Explain the primitive data structure and non-primitive data structure. 6
- (b) What is data structure ? Explain different operations that can be performed on data structure. 6

OR

2. (a) What is Array ? Explain the representation of array in computer memory. 6
- (b) What is stack ? Explain the algorithm to insert the element into the stack using PUSH operation. 6
3. (a) What is recursion ? Explain the types of recursion with example. 6
- (b) Write a procedure for Tower of Hanoi problem using recursion. 6

OR

4. (a) Write an algorithm to generate Fibonacci series using recursion. 6
- (b) Explain translation from prefix to postfix using recursion. 6
5. (a) What is queue ? Write an algorithm to delete the element from the queue. 6
- (b) Explain the terms :
 - (i) Circular queue
 - (ii) Deque
 - (iii) Priority queue. 6

OR

6. (a) What is linked list ? Explain the memory representation of linked list. 6
- (b) Write an algorithm to insert the element into the queue. 6
7. (a) Define the following terms with suitable example :
 - (i) Degree of node
 - (ii) Sibling
 - (iii) Terminal Node
 - (iv) Level tree
 - (v) Node
 - (vi) Forest. 6
- (b) Explain binary tree with its diagrammatic representation. 6

OR

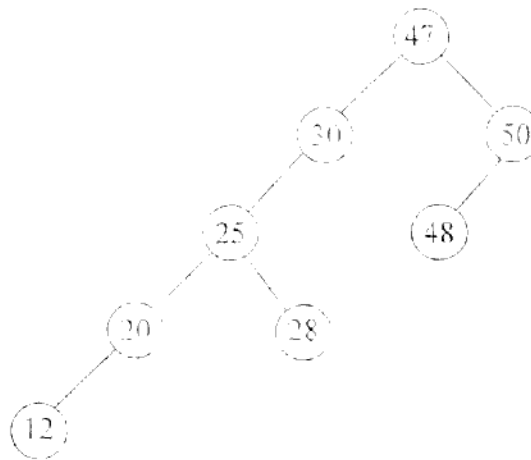
8. (a) Evaluate the following expression using binary tree :

$$X = A * (B + C) + D * E$$

if $A = 5$, $B = 6$, $C = 2$, $D = 12$ and $E = 4$.

6

- (b) Perform the following operation on binary search tree :



(i) Insert 26

(ii) Remove 30

(iii) Insert 49

(iv) Remove 25

(v) Insert 40

(vi) Insert 39

6

9. (a) What is sorting ? Explain bubble sort algorithm with example.

6

- (b) State and explain the Binary search algorithm with example.

6

OR

10. (a) What is searching ? Explain linear search method with example.

6

- (b) Explain the selection sort algorithm with example.

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