

Time: 3 Hours

**JUNE 2015**

Max. Marks: 100

**PLEASE WRITE YOUR ROLL NO. AT THE SPACE PROVIDED ON EACH PAGE IMMEDIATELY AFTER RECEIVING THE QUESTION PAPER.**

**NOTE: There are 9 Questions in all.**

- Question 1 is compulsory and carries 20 marks. Answer to Q.1 must be written in the space provided for it in the answer book supplied and nowhere else.
- The answer sheet for the Q.1 will be collected by the invigilator after 45 minutes of the commencement of the examination.
- Out of the remaining EIGHT Questions answer any FIVE Questions, selecting at least TWO questions from each part, each question carries 16 marks.
- Any required data not explicitly given, may be suitably assumed and stated.

**Q.1 Choose the correct or the best alternative in the following: (2×10)**

a. 

```
void main()
{
    int a=5, b=2;
    printf("%d", a++ +b);
}
```

- (A) results in syntax error (B) prints 7  
(C) prints 8 (D) none of these

b. When inorder traversing a tree resulted E A C K F H D B G; the preorder traversal would return

- (A) FAEKCDBHG (B) FAEKCDHGB  
(C) EAFKHDCBG (D) FEAKDCHBG

c. The situation when in a linked list START=NULL is

- (A) underflow (B) overflow  
(C) housefull (D) saturated

d. Which of the following is not the required condition for binary search algorithm?

- (A) the list must be sorted  
(B) there should be the direct access to the middle element in any sublist  
(C) there must be mechanism to delete and/or insert elements in list  
(D) none of these

e. The ascending order of precedence of bit-wise operators &, ^, | is

- (A) &, ^, | (B) ^, &, |  
(C) |, &, ^ (D) &, |, ^

**Code: AE52/AC52/AT52    Subject: C & DATA STRUCTURES**

- f. The extra key inserted at the end of the array is called a
- (A) end key (B) stop key  
(C) sentinel (D) transposition
- g. A data structure where elements can be added or removed at either end but not in the middle
- (A) Linked lists (B) Stacks  
(C) Queues (D) Deque
- h. When new data are to be inserted into a data structure, but there is no available space; this situation is usually called
- (A) underflow (B) overflow  
(C) housefull (D) saturated
- i. Linked lists are best suited
- (A) for relatively permanent collections of data  
(B) for the size of the structure and the data in the structure are constantly changing  
(C) for both of above situation  
(D) for none of above situation
- j. The elements of an array are stored successively in memory cells because
- (A) by this way computer can keep track only the address of the first element and the addresses of other elements can be calculated  
(B) the architecture of computer memory does not allow arrays to store other than serially  
(C) both of (A) & (B)  
(D) none of these

**PART (A)**

**Answer at least any TWO Questions. Each question carries 16 marks.**

- Q.2**
- a. What is operator? Explain conditional operator with example. (5)
  - b. Explain various data types available in C with specific range. (5)
  - c. Convert:  $(5273)_8 = (?)_{10}$  (6)  
 $(4F2D)_{16} = (?)_2$
- Q.3**
- a. Explain syntax of printf() and scanf() function with example. (6)
  - b. Differentiate break and continue with example. (10)

**Code: AE52/AC52/AT52    Subject: C & DATA STRUCTURES**

- Q.4** a. What do you mean by recursion? Explain stack overhead in recursion with example. **(9)**
- b. Write a program in C to find the transpose of a matrix. **(7)**
- Q.5** a. Define structure. What is the difference between structure and Union? Create a structure STUDENT to keep the record of students and members of record should be accessed through pointers. **(10)**
- b. Discuss the main operations performed on a file with example. **(6)**

**PART (B)**

**Answer at least any TWO Questions. Each question carries 16 marks.**

- Q.6** a. Which one is better between Binary Search and Linear Search if elements are sorted? Differentiate with suitable example. **(6)**
- b. Explain bubble sort with a suitable program. **(10)**
- Q.7** a. What is Queue? How it is differentiated from stack? **(5)**
- b. How can array be implemented using Stack? Give the suitable example. **(6)**
- c. Write a program to reverse a linked list. **(5)**
- Q.8** a. What do you mean by Binary Search Tree? Write a program to count the number of nodes in BST. **(8)**
- b. Discuss how Binary Trees can be traversed. **(8)**
- Q.9** a. What is depth-first traversal and breadth-first traversal? **(8)**
- b. What is minimum-cost spanning tree? How minimum cost can be calculated? Explain with example. **(8)**