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

AMIETE – ET/CS/IT (Current Scheme)

Time: 3 Hours   **JUNE 2017**   **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. The _____ keyword is used to define a new datatype .
   (A) typedef   **(B)** structure
   (C) array   **(D)** enum

b. Which command is used to skip the rest of a loop and carry on from top of the loop again?
   (A) exit   **(B)** continue
   (C) switch   **(D)** break

c. The parameters in a function definition are
   (A) actual parameters   **(B)** dummy parameters
   (C) real parameters   **(D)** formal parameters

d. Array elements are stored in
   (A) scattered memory elements **(B)** direct memory locations
   (C) random memory locations   **(D)** sequential memory locations

e. The string is terminated with
   (A) 'o' character   **(B)** '/0' character
   (C) '\o' character   **(D)** '\n' character

f. Structure is a
   (A) primary data type   **(B)** derived data type
   (C) user defined data type   **(D)** null data type

g. Degree of a leaf node in a binary tree is
   (A) 3   **(B)** 0
   (C) 2   **(D)** 1

h. Nodes having common parent are called as
   (A) base   **(B)** leaves
   (C) root   **(D)** siblings

i. which of the following sorting methods can sort the elements in single pass only?
    (**A**) Bubble   (**B**) Selection
    (**C**) Merge   (**D**) Quick

j. Queue follows algorithm
    (**A**) LIFO   (**B**) FIFO
    (**C**) FILO   (**D**) LILO

PART (A)
Answer at least TWO Questions from this part. Each question carries 16 marks.

Q.2 a. Differentiate ternary and bitwise operators used in 'C'.   **(6)**

b. What is type casting and type conversion?   **(6)**

c. Explain about the data types in C.   **(4)**

Q.3 a. What is escape sequence? Write down some examples also.   **(4)**

b. Write a program to generate twenty Fibonacci numbers using while …loop.**(6)**

c. What is the purpose of switch statement, how it differs from other statements?
                                                                                          (6)

Q.4 a. What are the differences between call by reference and call by value? Explain
             with example.   **(8)**

b. Write a function swap to interchange two strings using pointers.   **(8)**

Q.5 a. Explain the various string handling functions in detail.   **(8)**

b. When do we use structures in C? Discuss it by taking suitable example.   **(6)**

c. What is a File? Specify the types of files.   **(2)**

PART (B)
Answer at least TWO Questions from this part. Each question carries 16 marks.

Q.6 a. Write an algorithm for transpose of a matrix.   **(6)**

b. Explain the Quick sort algorithm in detail.   **(10)**

Q.7 a. Explain the operations of Queue in detail with example.   **(8)**

b. Write an algorithm to search the largest element in the array.   **(8)**

Q.8   Explain about
             (i) Depth first spanning tree   **(8)**
             (ii) Adjacency matrix representation   **(8)**

Q.9 a. Write down some general comments on binary trees.   **(8)**

b. Write an algorithm for binary tree traversal.   **(8)**