B. E. E.T.C.E. 1st Year, 1st Semester, Supplementary Examination, 2017

C LANGUAGE & DATA STRUCTURE(OLD) Time: 3 hours   Full Marks: 100

Answer any four questions from Group A and any one from Group B.

Group -A

Q.1 (a) Write a C program to print "ETCE" and "JU" in two separate lines.   6

(b) Write a C program to first read your name, roll number, and CGPA. The same program should then display the above information in separate lines. Your program should have prompt statements like "Enter your name:".   10

(c) Name all the library functions you are using for 1(a) and 1(b). State where these functions are defined.   4

Q.2 (a) What is the purpose of an **if-else** statement in C?   4

(b) Write a C program to check whether a year is a leap year.   6

(c) Write a C program to implement a calculator. The program should perform addition, subtraction, multiplication, and, division of two inputted integers.   10

Q.3 (a) Discuss **for** loop in C.   5

(b) Write a C program to print n number of '*'s in a single line. The user should input the value of n.   7

(c) Write a C program to print $m \times n$ rectangle of '*'s. The user should input the values of m and n.   8

Q.4 (a) Explain the importance of using functions.   3

(b) Write a C function *avg* which will take three integers and return their average.   5

(c) Differentiate between a library function and a user-defined function with examples.   4

(d) Write a C program which will take two integers a and b and compute a^b. Use one library function and one user-defined function to obtain a^b.   8

Q.5 (a) What is an *array*? Declare a floating point array *cost* with 100 elements.   2+2

(b) Write a C program to find the maximum of 10 integers stored in an array.   10

(c) Write a C program to find the length of an inputted string.   6

Q.6 (a) Explain the importance of *indirection* (*) and *address* (&) operators in C.   4

(b) Write a C program to find the minimum of n integers stored in an array. The user should input the value of n.   10

(c) Create a *structure* in C to model a clock with second, minute and hour hands. Use C statements to assign values to the members of your structure. Complete program is not necessary.   6

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Group -B

Q.7 (a) What is a queue? State FIFO principle in the context of a queue.   2+2

(b) Explain the ENQUEUE and DEQUEUE operations with proper examples.   3+3

(c) Discuss C implementation of the two operations in 7(b).   5+5

Q.8 (a) Define a *tree* with a proper example. How it is different from a *linked list*?   3+2

(b) What do you mean by traversal of a tree? Name three different ways of traversing a tree.   2+3

(c) Obtain the *traversals* of the following tree in two different orders. Show your steps.   5+5