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Sub Code: KCS 101
Roll No.

B.TECH.
(SEM I) THEORY EXAMINATION 2018-19
PROGRAMMING FOR PROBLEM SOLVING

Time: 3 Hours ***Total Marks: 100***

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. Attempt *all* questions in brief. **2 x 10 = 20**

Qn.	Question	Marks	CO
a.	What is the difference between compiler and Interpreter?	2	CO1
b.	What are the good characteristics of an algorithm?	2	CO1
c.	What do you mean by scope and lifetime of a variable?	2	CO1
d.	Write a recursive function in C, which takes an input from user to calculate a factorial using the recursion concept	2	CO3
e.	How to use break statement in C? Explain with some sort of code.	2	CO3
f.	What do you mean by precedence and associativity while solving some arithmetic expressions?	2	CO1
g.	While compiling a code, write the name of two syntax and two logical errors.	2	CO2
h.	What is an array? In which situation array is advantageous over linked list?	2	CO5
i.	What is linked list? Write the self-referential structure of a node in linked list?	2	CO5
j.	Write the difference between structure and union.	2	CO5
k.	Draw the memory hierarchical structure of computer system.	2	CO1

SECTION B

2. Attempt any *three* of the following:

a.	Explain linear search and binary search technique for searching an item in a given array. Also write the complexity for each searching technique.	10	CO4
b.	A certain grade of steel is graded according to the following conditions: i. Hardness must be greater than 50. ii. Carbon content must be less than 0.7. iii. Tensile strength must be less than 5600 The grades are as follows: Grade is 10 if all the three conditions are met. Grade is 9 if condition (i) and (ii) are met Grade is 8 if condition (ii) and (iii) are met Grade is 7 if condition (i) and (iii) are met Grade is 6 if only one condition is met. Grade is 5 if none of the conditions are met. Write a program, which will require the user to give values of hardness, carbon content and tensile strength of the steel under consideration and output the grade of the steel.	10	CO3

c.	What do you mean by call by value and call by reference? Write an algorithm for swapping two numbers using call by reference technique. Also write a C program for the above stated algorithm.	10	CO5
d.	Explain Selection sort technique for sorting problem. Also write an algorithm for selection sort. Sort the following numbers using selection sort technique. 26,54,93,17,77,31,44,55,20	10	CO2
e.	Write a short note on following preprocessor directives with example: i. Macro Expansion ii. File Inclusion	10	CO5

SECTION C

3. Attempt any *one* part of the following:

a.	Describe the basic components of computer system with neat and clean block diagram. What do you mean by operating system? Ex	10	CO1
b.	Defined data types in C. Discuss primitive data types in terms of memory occupied, format specifier and range.	10	CO1

4. Attempt any *one* part of the following:

a.	Explain various types of arithmetic operators in C language with help of example. When precedence of two operators in an arithmetic expression is same, how associativity helps in identifying which operator will be evaluated first. Illustrate it with the example.	10	CO1
b.	What is case control structure in C.? What is the reason for using break statement at the end of each case in case control block?	10	CO1

5. Attempt any *one* part of the following:

Qn.	Question	Marks	CO
a.	Write the syntax format for **while**, **do while** and **for** loops. Write a program in C to multiply a matrix of dimension 4*4 and store the result in another matrix.	10	CO3
b.	What is a function? Why programmers use functions in code? While executing a function, how the values are passed between calling and called environment?	10	CO4

6. Attempt any *one* part of the following:

a.	Write short notes on following. 1. Enumerated Data Type 2. String	10	CO5
b.	What do you mean by order of complexity? Explain various notions to represent order of complexity with diagram	10	CO2

7. Attempt any *one* part of the following:

a.	What is dynamic memory allocation? Explain the calloc(), malloc(), realloc() and free() functions in detail. What is lifetime of a variable, which is created dynamically?	10	CO5
b.	Explain command line arguments in C with the help of example.	10	CO5