Registration No :

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MCA
MCA101

1st Semester Regular/Back Examination 2019-20
PROBLEM SOLVING AND PROGRAMMING USING C
BRANCH : MCA
Max Marks : 100
Time : 3 Hours
Q.CODE : HRB588
Answer Question No.1 (Part-1) which is compulsory, any EIGHT from Part-II and any TWO from Part-III.
The figures in the right hand margin indicate marks.

Part-I

Q1 **Only Short Answer Type Questions (Answer All-10)** **(2 x 10)**

a) If x= 20, y=-5, then write the values of x, y, and z after the execution of the following statement in a C program:
$$z = (x>y)?\ x++ : ++y;$$

b) Find the outputs/errors if any:
```
    main() {
inti=3;
            switch (i){
                case 1: printf("one");
                        break;
                case 2: printf("two");
                case 3: printf("three");
                        continue;
            }
    }
```
Justify your answer.

c) What do you mean by casting a value in C?
Give the general form of casting.

d) What will be the output of the following program? If you feel that there can be any compile time or run time error, point out the same. Justify your answer.

```
float *fp;
*fp=2.134;
            printf("%f\n",*fp);
```

e) Consider a computer that has 4 byte memory addresses. What will be the output of the following statement? Justify your answer.
printf("%d %d %d\n", sizeof(char *), sizeof(int *));

f) Write the output of the following C program:
```
        #include<stdio.h>
        main() {
                inti=32, j=0X20;
                intk,l,m;
                k=i/j;
l=i&j;
m=k^l;
printf("\n %d %d %d %d %d", i, j, k l, m);
}
```

g) What is a register variable? Which variables should be declared as register?

h) What do you mean by Distributed Computing System?

i) Write the output of the following C program:

```
#include<stdio.h>
main() {
        inti=32, j=0X20;
        intk,l,m;
        k=i/j;
l=i&j;
m=k^l;
printf("\n %d %d %d %d %d", i, j, k l, m);
}
```

j) State how to define and open a file in C.

Part-II

Q2   **Only Focused-Short Answer Type Questions- (Answer Any Eight out of Twelve)   (6 x 8)**

a) State the functions of storage classes (i.e., auto, static, extern, and register) with one suitable example.

b) What are the differences between identifiers and Symbolic constants? State the rules for constructing identifiers.

c) Write a C program to accept a floating point number and display the integer part and decimal part separately. Also display the correct ratio of integer part and decimal part.

For example: If input is 8.56 then output will be

Integer part : 08

Decimal part : 56

Ratio (Integer part/Decimal part) = 0.142

d) Explain "typedef" and "enumerated data types" with example and proper syntax.

e) Use recursive calls to evaluate

$f(x) = x - (x^3/3) + (x^5/5) - (x^7/7) + ...n$ times

f) Write a C program using structure to read and display the following information of 50 players:(i) player's name,

 (ii) player's batting average, and

 (iii) player's address (Parent name, City, State, Country with PIN code).

g) Write a C program for swapping of contents of two variables of character types by:

(a) call by reference , and

(b) call by value.

h) Write the output/errors of the following C program:

```
#include<stdio.h>
inti=5, j=10;
main()
        {
         inti=32;
printf("\n %d %d ", i, j);
for(i=1; i<=3; i++)
add();
}

add()
{
        static int x = 0;
         x = x+5;
printf("x = %d\n", x);
}
```

i) What do you mean by enumeration constants?

Find the outputs/errors if any:
```
    main()
{
inti=2, j;
            for(j = 0; j <=  3; j++)
            {
                    if(j = = i )
                                continue;

printf ("i = %d, j = %d", i, j);
                }
}
```

j) Write a C program to do the following:
   (a) To display "Who is the inventor of C?"
   (b) To accept an answer.
   (c) To print out "GOOD" and then stop, if the answer is correct.
   (d) To output the message "try again", if the answer is wrong.
   (e) To display the correct answer when the answer is wrong even at the third attempt and stop.

k) Write a C program to explain how pointer to a 2-Dimensional array can be used as a function parameter.

l) What do you mean by dynamic memory allocation? Differentiate between malloc and callock with one example.

Part-III
Only Long Answer Type Questions (Answer Any Two out of Four)

Q3 Write a C program to read a file containing movements of droplets in the format of (x, **(16)** y) in a simply 2-dimensional M x N matrix. We have to check each droplet by at least one checkpoint before reaching their destinations. Moreover, it is advised to place checkpoints at the common intersection of their routing paths, if any, in order to reduce the number of checkpoints. Find out the minimum number of checkpoints required to simulate the experiment.
One example is: Suppose the input file contains
Droplet 1
(0, 4)
(1, 4)
End Route

Droplet 2
(0, 4)
(0, 5)
(0, 6)
(0, 7)
(0, 8)
End Route

Droplet 3
(13, 8)
(14, 8)
End Route
Then, Your program should display:
Minimum number of checkpoints required to simulate the experiment is 2
(Hint. One checkpoint is sufficient to check Droplet 1 and 2 as they have common dimension (0, 4). Another checkpoint is required for Droplet 3 as it has no common dimension. So, total checkpoints required to simulate the experiment is 2.)

Q4   Write a C program to accept two 2-dimensional M x N matrices (say A and B). Find out their Transpose matrices (say A' and B'). Display the resultant matrix (say C) which is the product of A' and B' with mentioning the message "Whether Multiplication is POSSIBLE or NOT".   **(16)**

Q5   Write a C program which will read a file and count all occurrences of "BPUT" in that file. Then declare, define, and call a function which will combine all occurrences of "BPUT" in that file with "(ROURKELA, ODISHA)", i.e., BPUT (ROURKELA, ODISHA).   **(16)**

Q6   Write short notes on: **(16)**
  a)   String-Handling Functions
  b)   Bit fields
  c)   Error handling during I/O operations in case of File Management
  d)   Preprocessor Directives