Registration No: | | | | | | | | | | |

Total Number of Pages: 03 **MCA**

MCA101

1st Semester Regular /Back Examination 2016-17
Problem Solving and Programming In C
BRANCH: MCA
Time: 3 Hours
Max Marks: 100
Q.CODE: Y518
Answer Part-A which is compulsory and any four from Part-B.
The figures in the right hand margin indicate marks.

Part – A (Answer all the questions)

Q1 Answer the following questions: **(2 x 10)**

a) Convert $(12F.B3)_{16}$ into octal number system.

b) Find the output:

```
void main( ){
    int a = 15, b = 10, c=5;
    if ( a > b > c )
      printf("true");
    else  printf("false"); }
```

(i) true (ii) false (iii) 15 (iv) 10

c) _____ is a procedure for solving a mathematical problem in a finite number of steps that frequently involves repetition of an operation.

d) What will be the output of the following code:

```
void main( ){
char a[ ]="OCEAN";
a++;
printf("\n%s",a);
}
```

(i) OCEAN (ii) CEAN (iii) DEAN (iv) Compiler error

e) What would be the value of 'x' after execution of the following statements?

```
void main( ){
   int x=50;
   printf("\n %x %o", x, x);
}
```

(i) 50, 50 (ii) 32, 62 (iii) 23,26 (iv) 32, 32

f) The declaration float k[ ][3] = { {2.5}, {5.75}, {3.0} }; represents
(i) A one-by-three array (ii) A three-by-one array
(iii) A three-by-three array (iv) A two-by-three array

g) Consider a 32 bit compiler. We need to store address of integer variable to integer pointer. The size of integer pointer is _____.

h) The dynamic memory allocated using malloc( ) contains garbage values. State whether True/False

i) What will be the output?

```
#define SQUARE( A )  A * A
void main( ){
printf("Square = %d\t", SQUARE( 10+6 ));
}
```

(i) Square= 16 (ii) Square= 256 (iii) Square= 76 (iv) None of these

j) Identify the wrong declaration statement.

(i) int *p, a =10; (ii) int a = 10,*p = &a;

(iii) int *p = &a, a = 10; (iv) Both (i) and (ii)

Q2 Answer the following questions: **(2 x 10)**

a) Find the value of *x, *(x+2), *(x+10) for the following declaration:
char *x = "SALUTE TO INDIAN ARMY".

b) What is the output of the following code?

```
#include<stdio.h>
#define MIN( x,y)  ( ( x < y ) ? x : y )
void main( ){
int a;
a = MIN(7 + 4, 7 - 4);
printf ( " %d ", a);   }
```

c) Differentiate between auto & static variables. Give examples for each.

d) Calculate the address of arr [3][3] in the following declaration,
int arr[4][5]; where the base address of arr is 06800

e) What is the output of the following code?

```
void main(){
      int x =5;
      printf("\n %d %d %d \n",x,x<<2,x>>2);
       }
```

f) Find the output and justify your answer:

```
void main( ){
      char str[ 20 ] = "DEMONETIZATION";
      char * ptr;
      for(ptr = str; *ptr; ptr++)
         printf("%c", *ptr += 32);
       printf("Bye");
       }
```

g) Find the output of the following code:

```
char ch, *ptr;   ptr = &ch;
printf( " %d  %d ", sizeof(ch), sizeof(ptr) );
```

h) Find the output/compilation errors (if any):

```
void main( ){
  int a[ ]={ 1, 2, 3, 4, 5, 6 };
  int *ptr = a + 2;
  printf( " %d  %d ",  *++a,  - -*ptr );     }
```

i) Find the output:

```
void main( ) {
  float a[ ] = {12.5, 10.0, 13.5, 90.5, 0.5};
  float *ptr = &a[0];
  float *ptr2 = ptr + 3;
  printf( " %f  ", *ptr2);
  printf( " %d ",  ptr2 - ptr);    }
```

j) Write the minimal number of execution for *do..while* and *while* loop.

Part – B (Answer any four questions)

Q3 **a)** Design a menu driven program in C that performs the following operations: **(10)**
(i) To check a number is prime or not.
(ii)To check a number is Krishnamurthy number or not. A Krishnamurthy number is one whose sum of factorial of digits of the number equals the number.
(iii) To check a number is palindrome or not.

b) What is the difference between break and continue? Write a program to print the Floyd's triangle. **(5)**

Q4 **a)** Differentiate between malloc( ) and calloc( ). Create an array dynamically of n integers and sort the array in descending order. Then, find the maximum and minimum number present in the array. **(2+8)**

b) Write a program that will read a positive integer and find its binary equivalent. **(5)**

Q5 **a)** Differentiate between Call-By-Value and Call-By-Reference. Write a function that takes two numbers and find the GCD of two numbers using pointer. **(2+8)**

b) Write a recursive function to find the power of a number. **(5)**

Q6 **a)** Write a program to implement the following operations: **(10)**
(i) A function that checks whether two strings are equal or not.
(ii) Implement a function that copy the contents of one string in another string

b) Write a program that reads a sequence of strings from user input and counts the uppercase and lowercase characters present in the strings. The sequence is terminated with the input BYE. **(5)**

Q7 **a)** Write a program to create a record of n employees where n is the user input with the following attributes: Employee ID, Employee name, Salary, Contact No, Designation. Display the employee id, employee name, total salary of employee based on the following bonus given at the end of the year: **(10)**

Salary	Bonus
>= 90,000	30%
>=70,000 and < 80,000	20%
>=50,000 and <70,000	10%
Others	5%

b) What is self-referential structure? Explain it by taking an example. **(5)**

Q8 **a)** Write a program that takes two files input and then concatenate the contents of two files in a third file. Write the use and syntax of following file operations: fscanf ( ), fprintf( ), fseek( ). **(10)**

b) What is command-line arguments? Write a program that find the smallest of two numbers using command-line arguments. **(5)**

Q9 **a)** Write a program that takes a m x n matrix and check the matrix is square or not. If yes, then find the transpose of the matrix without using second matrix. **(10)**

b) Differentiate between array of pointers and pointer to an array. Give an example in each case to explain between them. **(5)**