MCA /1ST SEM/MCAP 1102(BACKLOG)/2020

INTRODUCTION TO PROGRAMMING
(MCAP 1102)

Time Allotted : 3 hrs **Full Marks : 70**

Figures out of the right margin indicate full marks.

Candidates are required to answer Group A and any 5 (five) from Group B to E, taking at least one from each group.

Candidates are required to give answer in their own words as far as practicable.

Group – A
(Multiple Choice Type Questions)

1. Choose the correct alternative for the following: **10 × 1 = 10**

(i) Which of the following conditions is equivalent to the condition (! ((x >= y) && (y >= z)))?
(a) (! (x >= z)) (b) ((x<y) || (y<z))
(c) ((x < y) && (y < z)) (d) (x <= z)

(ii) The output of the following code snippet would be
int z, x=5,y=-10,a=4,b=2;
z = ++x - --y * --b / a;
print z;
(a) 8 (b) 9 (c) 12 (d) 10

(iii) Which one is correct as an operator in C programming language given bellow:
(1) sizeof() (2) += (3)^ (4) printf() (5) while (6)|
(a) 1, 2, 3, 6 (b) 2, 3, 4 (c) 2, 3,6 (d) all of the above

(iv) Let the array A be initialized as: char A[10] = "HIT2021"; What is the content of A[7]?
(a) '0' (b) '\0' (c) '8' (d) Cannot be determined.

(v) Find the output of the code snippet given below
char *ptr = "HERITAGE";
printf("%cn", *&*&*ptr);
(a) Hn (b) HE (c) H (d) HERITAGE.

(vi) Which of the following is the better approach to do the operation i = i * 16?
(a) Multiply I by 16 and keep it (b) Shift left by 4 bit
(c) Add I 16 times (d) Shift right by 4 bit

(vii) Find the output of the following program

```
void fun(int *ptr){
        *ptr = 20+20;
}
int main(){
int y = 20;
printf("%d", fun(&y));
return 0;}
```

(a) Syntax error (b) 20 (c) Runtime error (d) 40

(viii) Which one of the following declaration is invalid?
(a) int 2_A (b) int A_2A (c) int A2_A (d) int AA2

(ix) The expression 4 + 6 / 3 * 2 – 2 + 7 % 3 evaluates to
(a) 7 (b) 6 (c) 4 (d) 3

(x) Let the following statement's output.

```
printf("%d",(printf("Hit")))
```

(a) Syntax Error (b) Hit (c) Hit3 (d) H

Group – B

2. (a) Justify, "the range of float (4 bytes) is -1.2E-38 to 3.4E+38".

(b) When is it not possible to convert an if-else ladder to switch-case?

(c) Write a program to count the number of prime numbers formed by removing one by one digits from the back of that number (Including the number itself). Let the number is 49999, so answer is 3. As 49999 is prime, 4999 is prime and 499 is also prime, but 49 and 4 are not prime.

4 + 3 + 5 = 12

3. (a) Explain with a suitable example, compare the followings:
(i) Break and Continue statement.
(ii) Pre decrement and Post decrement operator.

(b) When writing integer constants in C language, how are decimal constants, octal constants and hexadecimal constants distinguished from one another?

(c) Write a C program to print the pattern where the number of rows(h) is taken as input from user. For example, when h = 4, the following pattern will be the output.

4	5	6	7	6	5	4
	3	4	5	4	3	
		2	3	2		
			1			

4 + 2 + 6 = 12

Group – C

4. (a) Consider a currency system in which there are notes of six denominations, namely, Rs.1, Rs. 2, Rs.5, Rs.10, Rs. 50 and Rs. 100. If a sum of Rs. N is entered through the keyboard, write a C program to compute the smallest number of notes that will combine to give Rs. N.

   (b) Write a program to find the value of $f(2.25)$ correct up to 4 decimal places, where

$$f(x) = \frac{x}{3} - \frac{x^2}{3 \times 5} + \frac{x^3}{3 \times 5 \times 7} - \frac{x^4}{3 \times 5 \times 7 \times 9} + \cdots$$

5 + 7 = 12

5. (a) What is the advantage of array compare to primitive data type?

   (b) Consider the following recursive function. Assume that both n, k are positive.

```
int fun(int p, int q){
 if(q == 0)return 0;
 if(q % 2 == 0)return fun1(p + p, q/2)+p;
 return fun1(p + p, q/2) + p
}
```

What is the value will be returned by fun (3, 4)? Show step by step execution of the function.

   (c) A unique digit is a positive integer (without leading zeros) with no duplicate digits. For example 9, 123 and 214 are all. Whereas 444, 3225 and 300 are not. Given two positive integers, m and n, where m<n. Write a program to determine how many unique digit integers are there in the range of m and n (both inclusive) and display them.

2 + 4 + 6 =12

Group – D

6. (a) Explain the use of realloc() function with a suitable example

   (b) What do you mean by chain of pointer? Explain with an example.

   (c) Write a program to read the list of names and search a name which is given by the user. Where list of names will be taken from command line as an argument.

3 + 3 + 6 = 12

7. (a) Write a C program that deletes a substring from a given string without using string library functions. For example, let the given string be “Heritage Institute of Technology” and the substring be “Institute of” then the resultant string will be “Heritage Technology”.

   (b) Write a C function that takes a pointer to a string as parameter and replaces all spaces in the string by ‘-’ character and returns the number of spaces replaced.

   (c) Explain the meaning of *dangling pointer.*

5 + 5 + 2 = 12

Group – E

8. (a) Can the period operator be used with a pointer to structures? Explain.

   (b) What is union? How does the union differ from a structure?

   (c) Write a C function that takes two times which contain three elements hours, mins and secs and add two times. Use a following function is given below.

   Struct Time Add (Struct Time t1, Struct Time t2);

3 + 3 + 6 = 12

9. (a) Write a program to create a file named "info" to store the roll number and marks obtained in physics, chemistry and mathematics by several students. Then the program should take input from the file "info" and find the total marks obtained by each student and write all these information (roll number, physics, chemistry, mathematics and total marks) in another file named "result".

   (b) Explain the role of C pre-processor. What is macro and how is it different from C variable?

   (c) What do you mean by *'EOF'*. Explain the purpose to use.

6 + 3 + 3 = 12

Department & Section	Submission Link
MCA	https://classroom.google.com/u/1/w/Mjg4NDM5MTc2MzEx/tc/Mjk0NDM2OTI2NDc2