

MCA/1ST SEM/MCAP 1101/2019
INTRODUCTION TO PROGRAMMING
(MCAP 1101)

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) What will be output of following c program?

```
int main(){
    int i=0;
    for(i=0;i<20;i++){
        switch(i){
            case 0:i+=5;
            case 1:i+=2;
            case 5:i+=5;
            default: i+=4; break;
        }
        printf("%d ",i);
    }
    return 0;
}
```

(a) 0 5 9 13 17 (b) 5 9 13 17 (c) 12 17 22 (d) 16 21.

(ii) Inspect the following code snippet and find out the output:

```
int i = 4, x = 6;
double z;
z = x / i;
printf("z=%.2f\n", z);
```

(a) z = 0.00 (b) z = 1.50 (c) z = 1.00 (d) z = 2.00.

(iii) What is the output of this C code?

```
void m(int *p){
    int i = 0;
    for(i = 0; i < 5; i++)printf("%d\t", p[i]);
}
int main(){
    int a[5] = {0};
    m(&a);return 0;
}
```

(a) 0 0 0 0 0 (b) garbage value
(c) Run time error (d) compile time error.

(iv) What is the output of this C program?

```
int main(){
    char *s= "hello";
    char *p = s + 2;
    printf("%c\t%c", *p, s[1]);
    return 0;
}
```

- (a) l e (b) h e (c) l l (d) h l

(v) What is the output of this C code?

```
#define max(a, b) (a>b ? b:a)
#define squre(x) x*x
int main(){
    int i = 2, j = 3, k = 1;
    printf ("%d %d", max(i, j), squre(k));
    return 0
}
```

- (a) 3 2 (b) 2 3 (c) 3 1 (d) 1 3.

(vi) The meaning of the declaration `int (*ptr) [10];` is

- (a) *ptr* is array of pointers to 10 integers
 (b) *ptr* is an array of 10 integers
 (c) *ptr* is a pointer to an array of 10 integers
 (d) *ptr* is a pointer to array.

(vii) What is the output of this C code?

```
int main() {
    int a = 25;
    printf("%o", a);
    return 0;
}
```

- (a) 31 (b) 25 (c) 30 (d) garbage value.

(viii) Point out the error, if any, in the for loop:

```
int main(){
    int i = 1;
    for( ; ; ){
        printf("%d", i++);
        if (i > 10)
            break;
    }
    return 0;
}
```

- (a) Condition in the for loop is a must
 (b) Two semicolons should be dropped
 (c) for loop should be replaced by a while loop
 (d) No error.

Group – E

8.(a) Write a program to compare two dates entered by user. Make a structure named Date to store the elements day, month and year to store the dates. If the dates are equal, display "*Dates are equal*" otherwise display "*Dates are not equal*".

(b) How to define a union? Explain with an example how to access members of a union.

(c) What is the difference between a structure variable and a union variable in respect of memory allocation?

$$6 + (1 + 2) + 3 = 12$$

9. (a) What are the different types of file opening mode? How can you check whether a file exists by using the `fopen()` function?

(b) Explain macro with suitable example. When is it advantageous to implement a routine as a macro instead of function?

(c) State the uses of `fseek()`, `ftell()`.

$$(2+2) + (2+2) + (2+2) = 12$$

(ix) What would be the output of the following C code?

```
int main(){
    char str1[] = "Hello";
    char str2[] = "Hello";
    if (str1 == str2)
        printf("\n Equal");
    else
        printf("\n Unequal");
    return 0;
}
```

(a) Equal (b) Unequal (c) Error (d) None of these.

(x) Which of the following syntax is correct for command-line arguments?

- (a) `int main(int var, char *varl[])`
 (b) `int main(char *argv[], int argc)`
 (c) `int main(int argv, char argc[])`
 (d) Both (a) and (b).

Group – B

2. (a) Explain with example the use of type *casting* operation in C programming language.

(b) Write a program in C to find the maximum and minimum of three numbers with minimum number of comparison.

(c) Briefly describe about the storage classes in C programming language.
3 + 5 + 4 = 12

3. (a) Why is the use of the *goto* statement generally discouraged? Under what conditions might the *goto* statement be helpful? Discuss with proper example.

(b) Write down a loop structure in the following three way, that will calculate the sum of every third integer, beginning with $i = 2$ (i.e., calculate the sum $2 + 5 + 8 + 11 + \dots$) and for all values of i that are less than 100.

- (i) using a while loop.
 (ii) using a do - while loop.
 (iii) using a for loop.

(c) Suppose a break statement is included within the innermost of several nested control statements? Explain with suitable code segment.

3 + 6 + 3 = 12

Group – C

4. (a) Define function? Does a function return multiple values to the caller function using return statement? Briefly describe function declaration and definition with suitable example.

(b) Write down a function in C that takes x and n as inputs, and then find the value of the following series up to n terms :

$$x - \frac{x^3}{2 * 3} + \frac{x^5}{4 * 5} - \frac{x^7}{6 * 7} + \frac{x^9}{8 * 9} - \dots$$

(1 + 2 + 2) + 7 = 12

5. (a) Suppose function `F1()` calls function `F2()` within a program in C. Does the order of the function definitions make any difference? Explain with an example.

(b) How data types of formal parameters are specified in a function? What is the default value argument in a function prototype?

(c) Write a recursive function to calculate the sum of all digits of a number entered by the user.

3 + 4 + 5 = 12

Group – D

6. (a) What do you mean by a pointer-to-pointer variable? Explain with suitable example to discuss the declaration of different types of pointer-to-pointer variables.

(b) With an example show the initialization process of the following type arrays
 i) Floating point array
 ii) Character array

(c) Write a program in C to delete an element from a particular position in an array. Position will be taken from keyboard as input. After the deletion, the array elements must be in continuous locations.

3 + 3 + 6 = 12

7. (a) What is the difference between character array and string?

(b) Write a program in C to find whether a matrix is orthogonal or not. [An $n \times n$ matrix A is an orthogonal matrix if $AA^T = I$, where, A^T is the transpose of A and I is the identity matrix].

(c) Write a program in C that will count the number of words from an input string taken from command line.

1 + 6 + 5 = 12