



Printed Pages : 8

MCA-113

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 7303

Roll No.

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M.C.A.

(Only for the candidates admitted/Readmitted in the session 2008-09)

(SEM. I) EXAMINATION, 2008-09

COMPUTER CONCEPTS AND PROGRAMMING IN C

Time : 3 Hours]

[Total Marks : 100

SECTION - A

20×1=20

- 1 This question contains 20 objective type/matching/fill in the blanks/true-false type questions. Choose/match/fill/true or false correct answer :
- (a) Which is the benefit of Windows operating system?
- (i) multitasking
 - (ii) memory management
 - (iii) device management
 - (iv) all of these.
- (b) Interpreter :
- (i) Scans the online program and then translate it.
 - (ii) Translate the program word by word.
 - (iii) Translate the program line by line.
 - (iv) Translate the program page by page.



(c) Match the following : (Full marks are awarded if all matchings are correct)

- | | |
|--------------|-----------------|
| (A) $O(1)$ | (i) exponential |
| (B) $O(n)$ | (ii) cubic |
| (C) $O(n^2)$ | (iii) linear |
| (D) $O(n^3)$ | (iv) constant |
| (E) $O(2^n)$ | (v) quadratic |

(d) What will be output?

```
Void main ()
{int a=7;
    {int a =10;
        a++;
        printf ("%d", a);
    }
    clrscr ();
    printf("%d",a);
    getch();
}
```

- (i) 7
- (ii) 10
- (iii) 11, 7
- (iv) 7, 11

(e) The output of the program :

```
Main ()
{int x=2;
    If (x=3)
        printf ("true");
    else
        printf("false");
}
```

Is :

- (i) false
- (ii) true
- (iii) syntax error
- (iv) none of these

(f) What is printed?

```
int x = 'A'; /*ASCII for A is 65 decimal */
int y = 3;
printf ("%d", x<<y);
```

- (i) 65
- (ii) 195
- (iii) 520
- (iv) 69

(g) Which of the following is correct function declaration?

- (i) int status (code char, time float);
- (ii) int status (char code, time float);
- (iii) int status (char code, float time);
- (iv) int status (char, float, code, time);

(h) Suppose that the variable **letters** [0] has the character A as its contents and **letters** [25] has the character z as its contents. Also assume that the variable **temp** is of type char. What results from the following slice of code?

```
Temp = letters [25];
letters [25] = letters [0];
letters [0] = temp;
```

- (i) **letters** [0] has A and **letters** [25] has z.
- (ii) **letters** [0] has z and **letters** [25] has A.
- (iii) **letters** [0] has 0 and **letters** [25] has 25.
- (iv) None of these



- (i) Which of the following function is appropriate to read one character at a time?
- fscanf ()
 - fgetc ()
 - read ()
 - fgets ()
- (j) The contents of a file will be lost if it is opened in
- a mode
 - a- mode
 - w+ mode
 - a+ mode
- (k) The _____ function compares two strings identified by the arguments and has a value 0 if they are equal.
- (l) A variable declared inside a function is called _____.
- (m) A pointer variable can be assigned the _____ of another variable.
- (n) An array that uses more than two subscript is referred to as _____.
- (o) A compiler converts a _____ program to _____ program.
- (p) An invoking function must pass arguments to the invoked function. (true or false)
- (q) A macro, which is created through a #define directive, must be written in upper case letters. (true or false)
- (r) C requires that the programmer explicitly enters a null character at the end of every character string. (true or false)

- (s) A register variable may be defined either inside or outside of a function's body. (true or false)
- (t) Member variables of two different structures may have the same name. (true or false)

SECTION - B

2 Attempt any **three** parts of the following : **10×3=30**

- (a) (i) The factorial of an integer m is the product of consecutive integers from 1 to m , that is factorial $m = m! = m * (m-1) * \dots * 1$
Write an algorithm to compute the factorial of any integer m .
- (ii) Convert the following as stated :
- $(225.225)_{10}$ to $(\quad)_{16}$
 - $(11010111.110)_2$ to $(\quad)_8$
 - $(623.77)_8$ to $(\quad)_2$
 - $(2AC5.D)_{16}$ to $(\quad)_{10}$
 - $(198)_{12}$ to $(\quad)_{10}$
- (b) The total distance travelled by a vehicle in t seconds is given by

$$\text{Distance} = u t + (a t^2)/2$$
where u is the initial velocity(m/s), a is the acceleration (m/s^2). Write a C program to evaluate the distance travelled at regular intervals of time given the values of u and a . The program should provide the flexibility to the user to select his own time intervals and repeat the calculations for different values of u and a .



- (c) Write a C program that calculates the sum of the digits of an integer. For example, the sum of the digits of the number 2155 is 2+1+5+5 or 13. the programme should accept any arbitrary integer typed by the user.
- (d) Write a C program to multiply the two matrices.
- (e) Write a C program to copy one file to another.

SECTION - C

10×5=50

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

- (a) Explain the purpose of an operating system. Give examples of activities an operating system might performs on a multi-user mainframe.
- (b) What do you mean by structured programming? - Explain.

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

- (a) A C program contains the following declarations and initial assignments :

int i = 8, j = 5;

float x = 0.005, y = -0.01;

char c = 'c', d = 'd';

Determine the value of each of the following expressions :

- (i) $(3*i - 2*j) \% (2*d - c)$
- (ii) $(i - 3*j) \% (c + 2*d) / (x - y)$
- (iii) $2 * ((i/5) + (4*(j-3)) \% (i+j-2))$
- (iv) $(x > y) \&\& (i > 0) \&\& (j < 5)$
- (v) $(x > y) \&\& (i > 0) !! (j < 5)$

- (b) What is meant by storage class of a variable? Compare automatic variable and external variable.

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

- (a) What is the output of the following program? Give justification in support of your answer.

```
#include<stdio.h>
```

```
Main ()
```

```
{
```

```
    int i, j, k, x = 0;
```

```
    for (i = 0; i<5; ++i)
```

```
        for (j=0; j<i; ++j) {
```

```
            k = (i+j - 1);
```

```
            if (k % 2 == 0)
```

```
                x += k;
```

```
            else
```

```
                if (k% 3 == 0)
```

```
                    x += k-2;
```

```
                    printf ("%d", x);
```

```
            }
```

```
        printf ("\n x = % d", x);
```

```
}
```

- (b) Explain the difference between the definition of a function and the declaration of a function. Write a function to interchange the values of two variables without using third variable.



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

(a) What is dynamic memory allocation? - Explain.
Also explain the purpose of free function.

(b) (i) given the definitions

int t [30];

int *p;

one of the statements

t = p;

p = t;

is correct and the other is incorrect? Which is which? Explain what happens when the correct statement is executed. What is the error in the incorrect statement?

(ii) Suppose characters in an array of 10 char variables. Explain the difference between the expressions

characters + 5

*(characters + 5)

7 Attempt any **two** parts of the following :

(a) What are the different string handling functions?
Explain any one with example.

(b) What is the conditional compilation? How does it help a programmer?

(c) State the following :

(i) Preprocessor directives

(ii) Sequential search.

