

A3-R4: PROGRAMMING AND PROBLEM SOLVING THROUGH 'C' LANGUAGE

NOTE:

1. There are **TWO PARTS** in this Module/Paper. **PART ONE** contains **FOUR** questions and **PART TWO** contains **FIVE** questions.
2. **PART ONE** is to be answered in the **TEAR-OFF ANSWER SHEET** only, attached to the question paper, as per the instructions contained therein. **PART ONE** is **NOT** to be answered in the answer book.
3. Maximum time allotted for **PART ONE** is **ONE HOUR**. Answer book for **PART TWO** will be supplied at the table when the answer sheet for **PART ONE** is returned. However, candidates, who complete **PART ONE** earlier than one hour, can collect the answer book for **PART TWO** immediately after handing over the answer sheet for **PART ONE**.

TOTAL TIME: 3 HOURS

TOTAL MARKS: 100
(PART ONE – 40; PART TWO – 60)

PART ONE **(Answer all the questions)**

1. Each question below gives a multiple choice of answers. Choose the most appropriate one and enter in the “tear-off” answer sheet attached to the question paper, following instructions therein. (1x10)
 - 1.1 Which of the following is not an unconditional control statement in 'C'?
 - A) break
 - B) continue
 - C) exit()
 - D) while
 - 1.2 What will be the output of the following program?

```
Main()
{
    int x = 5;
    While ( x == 1)
        x = x -1;
    printf ( " %d\n", x);
}
```

 - A) 5
 - B) 4
 - C) 0
 - D) syntax error
 - 1.3 Which of the following is not a proper storage class in 'C'?
 - A) auto
 - B) dec
 - C) static
 - D) extern
 - 1.4 Which of the following is a wrong pointer declaration?
 - A) int *int(a);
 - B) int *x, *y;
 - C) float *aptr;
 - D) int *x, float *y;

- 1.5 The value of S[5] in the segment char s[15] = "MICROPROCESSOR" is
A) P
B) O
C) R
D) None of the above
- 1.6 Function putchar() displays
A) one word at a time on the screen
B) one character at a time
C) result on the screen
D) None of the above
- 1.7 The sqrt() function is available in
A) conio.h
B) string.h
C) math.h
D) graphic.h
- 1.8 If 'a' is an integer variable, then a = 5/2 will return a value
A) 2.5
B) 2
C) 2.000000
D) 2.500000
- 1.9 Which of the following a not a basic data type used in C language?
A) double
B) float
C) char
D) array
- 1.10 pow(x,y) is used to
A) power of y^x
B) power of x^y
C) logarithm of x on the base y
D) Such function does not exist

2. Each statement below is either TRUE or FALSE. Choose the most appropriate one and ENTER in the “tear-off” sheet attached to the question paper, following instructions therein. (1x10)

- 2.1 A break statement is used to exit from a statement block in a switch statement.
- 2.2 Recursion cannot call a function itself.
- 2.3 An array is a group of related data item that share a common memory location in RAM.
- 2.4 In the declaration `int(*p)()` p is a pointer to a function that returns an integer.
- 2.5 If $m = 5$, $++m + ++m$ is equal to 12.
- 2.6 The memory required in structure is less than union.
- 2.7 A function in ‘C’ must have at least one argument.
- 2.8 The programming language happens to be the high level language with some assembly language features.
- 2.9 In C functions the actual expressions / parameters are passed on to formal parameters using the method of call by value result
- 2.10 In C the graphics may be used to add graphical features to the program.

3. Match words and phrases in column X with the closest related meaning/ word(s)/phrase(s) in column Y. Enter your selection in the “tear-off” answer sheet attached to the question paper, following instructions therein. (1x10)

| X | | Y | |
|------|--|----|---|
| 3.1 | <code>exit(0)</code> in a ‘C’ program represents | A. | Increase or decrease of pointer value |
| 3.2 | The difference in ‘a’ and “a” is | B. | derived data type |
| 3.3 | pointer arithmetic refers to | C. | Termination of a program |
| 3.4 | <code>int *mptr, m=25; mptr=&m</code> performs | D. | Converts a data type to another data type |
| 3.5 | Function that detects error in file accessing | E. | User define data type |
| 3.6 | Array is a | F. | Initializes the pointer |
| 3.7 | The statement block in while is executed | G. | $f=(X < 0)? 0 : 1$ |
| 3.8 | Typecasting | H. | <code>ferror()</code> |
| 3.9 | Formatted print is used to | I. | Perform operations in string |
| 3.10 | <code>string.h</code> is used to | J. | Take printout in special format |
| | | K. | ‘a’ is a single character constant and “a” is a string character constant |
| | | L. | When the values of the condition is true |
| | | M. | Bitwise operator |

4. Each statement below has a blank space to fit one of the word(s) or phrase(s) in the list below. Enter your choice in the “tear-off” answer sheet attached to the question paper, following instructions therein. (1x10)

| | | | | | |
|-----------|------------------------------------|-----------|---------------|-----------|---------------|
| A. | static | B. | calloc() | C. | main() |
| D. | char | E. | free() | F. | Right to left |
| G. | Close and disconnect the file from | H. | Left to right | I. | register |
| J. | atoi() | K. | putpanel() | L. | stdin |
| M. | stdout | | | | |

- 4.1 _____ is the function to convert a ASCII character into an integer.
- 4.2 In C an array of character is known as _____.
- 4.3 The line from which a program execution begins is _____.
- 4.4 _____ function is used to release the memory allotted in dynamic memory allocation.
- 4.5 The dynamic memory allocation function are _____ and malloc().
- 4.6 p++ has associativity _____.
- 4.7 The use of _____ is considered unstructured programming.
- 4.8 The storage class _____ has global visibility.
- 4.9 The standard file, in 'C', _____ is connected to screen.
- 4.10 _____ is used to draw a point on the monitor screen in given coordinate position.

PART TWO
(Answer any **FOUR** questions)

- 5.**
- a) Make the flow chart to solve the following cosine series.
 $S = 1 - x^2/2! + x^4/4! - x^6/6! + \dots$ 100 terms
- b) What is meant by formatted output? Mention the output of the following commands.
- ```
int n = 28;
```
- i) printf ( "% 5d,"n);  
ii) printf ( "%+5d", n);  
iii) printf ( "%+5d", n);
- c) Write a recursive function to compute factorial of a number. **(5+5+5)**
- 6.**
- a) Write a 'C' program to read an array of names and to sort them in alphabetical order.
- b) What are different storage classes in 'C'? Explain each. **(7+8)**
- 7.**
- a) Write a program to compute the following series:  
 $x + x^3/3! + x^5/5! + \dots$   
To a given accuracy for x from  $0^0$  to  $180^0$  in the steps of  $10^0$ , use a inbuilt function FACT(n) to compute the factorial.
- b) What is meant by structure data type? How do we reference the elements of a structure? Give example of how a value of a structure can be assigned to another structure. **(8+7)**
- 8.**
- a) What do you mean by a pointer variable? Write a function in 'C', using pointers for the array of elements, for sorting the elements.
- b) Define a structure of employees of an organization with the following fields:  
Empno, Empname, Date\_of\_joining, Salary, Department  
Write a program which accepts names of ten employees and print them on the screen. **(8+7)**
- 9.**
- a) What are preprocessor directions? Why do we need them? Explain various preprocessor directives.
- b) Give an example of
- i) Switch statement  
ii) Conditional expression  
iii) Nesting of loops  
iv) Dynamic memory allocation **(7+8)**