

07002

MCA (Revised)
Term-End Examination
June, 2010

**MCS-011 : PROBLEM SOLVING AND
PROGRAMMING**

Time : 3 hours

Maximum Marks : 100

(Weightage 75%)

Note : Question Number 1 is compulsory. Attempt any three questions from the rest.

1. (a) Write a program in C to search a record in an existing file and to update it. 10
- (b) Explain the concept of array of pointers. 10
Using pointers write a program to test whether the given string is a palindrome or not.
- (c) Differentiate between :
 - (i) Various storage classes 6
 - (ii) Structure and union 4
- (d) Why C is called a middle level language ? 10
Give a flowchart to explain the program execution process. Explain each step in detail.

2. (a) Write a program to search an element in a given list of elements using linear search. 8
- (b) Write a recursive program to calculate the factorial of a given number. 8
- (c) Give an example to explain null pointer assignment. 4
3. (a) Write a program in C to find the multiplication of 2 matrices of size (3×3) . 5
- (b) Write a macro for the following : 4x2=8
- (i) to find largest number among 3 given numbers.
- (ii) to find cube of a given number.
- (c) Write a program in C, using structures to generate a report for students which displays Roll No. and Name of student, total marks obtained by the student. Assumptions can be made wherever necessary. 7
4. (a) Write a program and flowchart to display the following pattern : 8
- H
- He
- HeL
- HeLL
- HeLLO
- HeLL
- HeL
- He
- H

- (b) Write a macro to demonstrate : 6
#define, #if, #else
preprocessor commands.
- (c) Write a program in 'C' to find 6
 $1^2 + 3^2 + 5^2 + 7^2 + 9^2 + \dots + N^2$
5. (a) Write a program to append the contents of 7
second file to the contents of first file.
- (b) Explain the difference between a top-down 5
approach and a bottom-up approach in
programming.
- (c) What do you understand by a decision- 8
control statement ? Give an example of
each.
-

00647

MCA (Revised)

Term-End Examination

December, 2010

**MCS-011 : PROBLEM SOLVING AND
PROGRAMMING**

Time : 3 hours

Maximum Marks : 100

(Weightage 75%)

Note : Question number 1 is compulsory. Attempt any three questions from the rest.

1. (a) Write an algorithm, in C to sort a given list of numbers in ascending order using bubble sort. 10
- (b) What is a pointer ? Give example. Write a program to swap the values using "pass by value" and "pass by reference" method. 10
- (c) Explain file handling in C. What is EOF and its value ? Write a program to copy one file to another. 10
- (d) Explain (with example) :- 2.5x4=10
 - (i) Unary Operators in C
 - (ii) Array
 - (iii) Syntax and semantic errors.
 - (iv) Size of operator

2. (a) Write a program in C to display the following output :- 8

```

      1
    2 1 2
  3 2 1 2 3
4 3 2 1 2 3 4
  3 2 1 2 3
    2 1 2
      1

```

- (b) Write a program to subtract 2 matrices of size 3×3 . 8

- (c) Explain function prototype with examples. 4

3. (a) What are various storage classes in C, give an example of each. 6

- (b) Write loops that calculate the sum of given series :- 7

1+2+4+7+11+16+_____ with :-

(i) do - while loop.

(ii) for loop.

- (c) Using an example, give steps to calculate the average and worst case complexity of an algorithm. 7

4. (a) Differentiate between :-

2.5x4=10

- (i) & and & &
- (ii) text and binary file
- (iii) pointer to function and function pointer.
- (iv) linker and loader.

(b) A C program contains the following declaration :-

5x1=5

```
int arr [3][2] =
```

```
{ {1,2}, {3,4}, {5,6} };
```

What is the meaning of the following :

- (i) * (arr + 2)
 - (ii) * (* (arr) + 1) + 1)
 - (iii) * (* (arr) + 2))
 - (iv) arr
 - (v) (* (arr) + 2) + 1)
- (c) Write a program in C to concatenate 2 strings without using strcat () function. 5

5. (a) Write a program in 'C' to implement binary search in a given list of numbers. Also give the average complexity of binary search. 10

(b) Using the concept of structures, write a program to display the salary, department, and other details of employees of an organisation. Make necessary assumptions wherever necessary. 5

(c) Explain dynamic memory allocation with examples. 5

MCA (Revised)
Term-End Examination
June, 2011

**MCS-011 : PROBLEM SOLVING AND
PROGRAMMING**

Time : 3 hours

Maximum Marks : 100

(Weightage 75%)

Note : Question number 1 is **compulsory**. Answer **any three** questions from the rest.

1. (a) What is an algorithm ? Explain basic features of an algorithm. 5
- (b) Write a C program to check whether a given string is a palindrome or not. 10
- (c) Consider the following program segment in programming language C : 6

sum = 0;
for(i=1; i ≤ 10; i++)
sum + = i;

Write an equivalent program segment using

- (i) do - while
(ii) while

- (d) What is a syntax - error ? Give an example of syntax error in a C - program. 4
- (e) Explain different arithmetical and logical operators available in C, with the help of examples. 10
- (f) Explain the use of *malloc* function in C programming. 5
2. (a) What is an array ? Write a C program to add two matrices of 3×3 using arrays. 10
- (b) What is the scope of a variable ? Explain difference between global and local variable with example program. 10
3. (a) What is a string ? Write a function in C for string concatenation. Without the use of inbuilt string function. 10
- (b) What is a macro ? Explain how a macro is defined in C. Also explain major differences between a macro and a function. Explain a situation when macro should be preferred over function with an example. 10

4. (a) What is a file in C programming ? Explain the use of fopen function in file handling. Explain different mode in which a file can be opened. 10
- (b) What is a pointer ? Write a C program using pointer to print the name and price of the items sold in a retail shop on a specific date. 10
5. (a) What is a structure ? Explain how a structure is declared in C. Write a program in C using structure to store records of students in a class of 20 students. 10
- (b) Write a C program to demonstrate the use of switch - case statement. 5
- (c) What is recursion ? Write a recursive C program to find the factorial of a given number. 5
-

MCA (Revised)

Term-End Examination

June, 2012

**MCS-011 : PROBLEM SOLVING AND
PROGRAMMING**

Time : 3 hours

Maximum Marks : 100

(Weightage 75%)

Note : Question number 1 is compulsory.

*Attempt **any three** questions from the rest.*

1. (a) It is said that 'C' is a middle level language. 10
Mention those features of 'C' which enables this description. Give a short note on the 'compilation' process in 'C'.
- (b) Develop a flowchart and then write a 10
program in 'C' to sort strings passed to the program through command line arguments. Also display the sorted strings.
- (c) Define 'pointers' in C. How is a Pointer 10
variable declared ? Give examples and explain. Enumerate the utility of Pointer variables, with an example.

- (d) Differentiate between : 2½x2=5
- (i) Function and sub routine
 - (ii) Structure and Union with examples of each.
- (e) Give the precedence chart for the operator in 'C'. 5
2. (a) Differentiate between an execution error and a syntax error. Give examples of execution and syntax errors. 4
- (b) Write and explain the action of 'WHILE' statement. Develop a program to compute the average of every 3rd integer lying between 1 and 100. 8
- (c) Write a program in 'C' to copy the contents of one file to another file. 8
3. (a) Write a program in 'C' to compute the series : 5
- $(x) + (x+n) + (x+n^2) + (x+n^3) + \dots$
- for a total of m terms.
- Where m, n and x are to be accepted by the user.
- (b) Differentiate between goto statement, break and continue. 4
- (c) What is an assignment operator ? Give example of its usage. 3

- (d) What is a pointer to an array? Differentiate it from an array of pointers. Write a program using pointer to array to calculate the sum of n given numbers. 8
4. (a) Implement Binary search in 'C' language. 8
- (b) With every use of a memory allocation function, what function must be used to release allocated memory which is no longer used ? Give syntax also. 4
- (c) Write a recursive function in 'C' to count the number of nodes in a singly linked list. 8
5. (a) How are arrays processed in 'C' ? Illustrate with the help of 2-D arrays as examples. 6
- (b) Give syntax of gets () and getch () ? Also give examples of usage of scanf () and printf (). 6
- (c) A program in 'C' language contains the following declaration : 8
- Static int x[8] = {1,2,3,4,5,6,7,8};
- What is the meaning of :
- (i) x ?
- (ii) (x+2) ?
- (iii) *x?
- (iv) *(x+2) ? Explain the results.
-

MCA (Revised)

Term-End Examination

December, 2012

MCS-011 : PROBLEM SOLVING AND
PROGRAMMING

Time : 3 hours

Maximum Marks : 100

(Weightage 75%)

Note : Question number 1 is compulsory. Attempt any three questions from the rest.

1. (a) Draw a flowchart and then develop an interactive 'C' program which finds whether a given integer number is prime or not. Make the use of a function subprogram. 10
- (b) Differentiate between various storage classes in 'C'. 5
- (c) Write down a recursive function in 'C' to calculate the factorial of a given number. 5
- (d) Explain the concept of pointer to an array. Write a program in 'C' to copy the contents of an array to another array using pointers. 10
- (e) Write a 'C' program that will enter a line of text, store it in an array and then display backwards. The length of the line should be undefined (being terminated by ENTER key), but less than 80 characters. 10

2. (a) Explain null pointer assignment. Also give an example of use of null pointer. 4
- (b) Write a macro for the following : 2x3=6
- (i) to find square of a given number.
- (ii) to find smallest of 3 given number.
- (c) Write a program in 'C' to enter two 4×4 matrices and to display the product of these matrices. Explain and give suitable documentation. 10
3. (a) Write a program and flowchart to display the following : 8
- A
 B A B
 C B A B C
 B A B
 A
- (b) Give the syntax of getch() and gets(). Give examples also. 4
- (c) Explain the action of do-while statement. With an example. 3
- (d) What is the difference between a call by value and call by reference? Explain with examples. 5
4. (a) Write a C program to create a file and copy the contents of another given file into this newly created file. 8
- (b) What is # ifdef ? Give an example to explain use of # ifdef. 4

- (c) Differentiate between a structure and a union. Write a structure for a student and write a 'C' program to display the marks of the student for five subjects and also calculate the percentage of marks obtained. 8
5. (a) Give the syntax and examples of usage of scanf() and printf(). 4
- (b) Give 5 distinctive features of 'C' which states it to be a structured programming. What are the differences between a low level, a middle level and a high level language. Give examples. 6
- (c) Write a program to display the following patterns : 5
- ```

1 2 3 4 5
 2 3 4 5
 3 4 5
 4 5
 5

```
- (d) What is array of pointers to string? Declare an array of pointers to string having names of your five friends. 5

---

**MCA (Revised)**

**Term-End Examination**

**June, 2013**

**MCS-011 : PROBLEM SOLVING AND  
PROGRAMMING**

*Time : 3 hours*

*Maximum Marks : 100  
(Weightage 75%)*

---

*Note : Question number 1 is compulsory. Attempt any three questions from the rest.*

---

1. (a) Explain type cast and size of operator in C language with example. 6
- (b) Write an algorithm to check whether the given number is prime or not. 5
- (c) What is the difference between High level language and low level language ? Why C is referred as middle level language ? 6
- (d) How many bytes are assigned to store for following : 3
  - (i) Double
  - (ii) Unsigned char
  - (iii) Unsigned integer



- (e) Write a program segment to generate the following pattern using "for" and "while loop" 6

\*

\* \*

\* \* \*

\* \* \* \*

- (f) Explain the concept of stepwise refinement technique. 4

- (g) Give the C expression for the following algebraic expression : 6

(i) 
$$\frac{ab^4c^2 - d}{m - n}$$

(ii) 
$$ab - \left[ (e + f)^9 / c \right]$$

- (h) What is a logical error ? Give an example of logical error in C. 4

2. (a) What is a structure ? How structures are passed as function arguments ? Explain with an example. 10

- (b) What is an array ? How arrays are declared and initialized ? Write a C program to add two matrices of  $3 \times 3$  using arrays. 10

3. (a) Write a program to find out square and cube of given number using macros. 6
- (b) What is # define preprocessor in C. How it is implemented and used in C ? 4
- (c) What is a string ? Write a function in C to convert lower case letters to upper case letters in a given string *without* using *strup* ? 10
4. (a) What are address and indirection operators in C ? How strings are declared through pointers ? Write a program that test a string for a palindrome using pointer notation. 10
- (b) Give the types of file supported in C. Explain formulated Input/Output functions as well as string Input/Output functions. 10
5. (a) Explain the use of following functions in C : 10
- (i) Calloc function
  - (ii) realloc function
  - (iii) fseek ( )
  - (iv) ftell ( )
  - (v) strcpy ( )
- (b) Differentiate Sequential and Random Access files. 4
- (c) Explain briefly null pointer assignment. Write a program in C to illustrate this concept. 6

## MCA (Revised)

## Term-End Examination

December, 2013

MCS-011 : PROBLEM SOLVING AND  
PROGRAMMING

Time : 3 hours

Maximum Marks : 100  
(Weightage 75%)

**Note :** Question number 1 is *compulsory*. Answer *any three* questions from the rest.

1. (a) Explain comma and conditional operator in C language with examples. 6
- (b) Write an algorithm to calculate the factorial of a given number. 5
- (c) Write a program to add 2 matrices A and B of order  $3 \times 3$ . 6
- (d) Name different categories of constants in C language. 3
- (e) Write a program segment to generate the following pattern using *for* loop and *while* loop. 6

```

1
1 2
1 2 3
1 2 3 4

```

- (f) Explain the concept of Top Down Design Technique. 4
- (g) Give the C expression for following algebraic expression 6
- (i) 
$$\frac{(a + b)^4 c^2 - d \times e}{m + n}$$
- (ii) 
$$ab + (e - f)^4 / (c \times d)$$
- (h) What is a runtime error ? Explain with an example. 4
2. (a) What is an union ? Explain how a union is declared in C. Explain with an example how members of a union are accessed. Also, state the difference between an union and a structure. 10
- (b) Explain syntax of Array declaration write a C program in C to multiply two matrices of  $3 \times 3$  using arrays. 10
3. (a) Differentiate between macros and functions. Explain a situation when macro should be preferred over function. 4

- (b) Write a macro to the display string INDIA in following pattern : 6

I  
IN  
IND  
INDI  
INDIA  
INDI  
IND  
IN  
I

- (c) What is a string ? Write a function in C to find a string length without using `strlen()`. 10

4. (a) What are array of pointers ? How they are declared and initialised ? Using pointers write a program to read and display list of names of students. 10

- (b) What is the purpose of using header files in C. Explain functions that are used in C for reading and writing of characters. Also, explain string input and output function in C. 10

5. (a) Explain shift operators with examples. 4

- (b) Explain Random and Sequential Access Files. 4

- (c) Explain the use of following functions in C : 6x2=12

- |                            |                            |
|----------------------------|----------------------------|
| (i) <code>malloc()</code>  | (ii) <code>fopen()</code>  |
| (iii) <code>fgets()</code> | (iv) <code>strcat()</code> |
| (v) <code>fputc()</code>   | (vi) <code>fclose()</code> |

**MCA (Revised)/BCA (Revised)****Term-End Examination****June, 2014****MCS-011 : PROBLEM SOLVING AND  
PROGRAMMING***Time : 3 hours**Maximum Marks : 100**(Weightage 75%)*


---

**Note :** Question Number 1 is **compulsory**. Answer **any three** questions from the rest.

---

1. (a) Write an algorithm and draw corresponding flowchart to calculate the factorial of a given number. **10**
- (b) Using recursion, generate 'n' terms of fibonacci series ( $n > 0$ ). **10**
- (c) Using file handling, create a file, insert some characters and count them. **10**
- (d) Using pointers concept, reverse a given string. **10**
2. (a) Write a program to find the string length without using `strlen()` function. **10**
- (b) Write a program using C to calculate the Net salary if the basic, TA, DA, allowances and deductions are given, using structures concept. **10**

3. (a) What is the use of *continue* statement ? 5  
Explain with an example.
- (b) Explain any four string functions with 10  
example for each.
- (c) How will you write a function with no 5  
arguments and with return value ? Give an  
example.
4. (a) Write a program to swap two values, using 10  
cell-by-value method.
- (b) Write a program in C to multiply two 10  
matrices A and B.
5. (a) Write a macro to display the string COBOL 10  
in the following pattern.  
C  
C O  
C O B  
C O B O  
C O B O L
- (b) Define a macro to find maximum among of 10  
3 given numbers using # ifdef, # else.
-

**MCA (Revised) / BCA (Revised)**

**Term-End Examination**

**December, 2014**

07464

**MCS-011 : PROBLEM SOLVING AND  
PROGRAMMING**

*Time : 3 hours*

*Maximum Marks : 100*

*(Weightage 75%)*

---

**Note :** *Question number 1 is compulsory. Answer any three questions from the rest.*

---

1. (a) Design an algorithm and draw a corresponding flow chart and write a C program to divide two numbers. 10
- (b) What are the rules for naming variables in C? 5
- (c) Write a program to search in an already created file "xyz.dat" which contains students' data and update it.  
Hint : Use file handling concept. 10
- (d) Write a program to calculate the first smallest divisor of a number using break statement. 5
- (e) Write a program in C to swap the values of two variables using pointers concept. 10



2. (a) Write a program that initialises 3 names in an array of strings and displays them. 5
- (b) What is call by value ? Give example. 5
- (c) Explain recursion program with a suitable example. 10
3. (a) Write a program to print first 10 even numbers using *goto* statement. 5
- (b) Explain Function Prototypes with an example for each. 10
- (c) Write a program to perform the comparison of two strings (use string function). 5
4. (a) Write a program in C to sort list of  $n$  integers, using any of the sorting algorithms. 10
- (b) Write a program to test whether the given string is a palindrome or not. 10
5. (a) Write a macro to demonstrate #define, #if, #else preprocessor commands. 10
- (b) Write a C program using fread() and fwrite() to create a file of records and then read and print the same file. 10
-

**MCA (Revised) / BCA (Revised)**

**Term-End Examination**

**June, 2015**

02493

**MCS-011 : PROBLEM SOLVING AND  
PROGRAMMING**

*Time : 3 hours*

*Maximum Marks : 100  
(Weightage 75%)*

---

**Note :** *Question number 1 is compulsory. Answer any  
three questions from the rest.*

---

1. (a) Explain the different storage classes in 'C' programming language. 5
- (b) What is the difference between "while-do" and "do-while" loop ? 5
- (c) Design a flowchart and then write a program in 'C' to convert a given complete string to upper case. 10
- (d) What do you mean by "array of pointers" ? Write a program in 'C' to calculate the sum of the corresponding elements of two arrays of integers of same size. 10

- (e) List and explain the precedence of Arithmetic, Logical and Relational operators in 'C'. 10
2. (a) What is the difference between '&' and '&&' in 'C'? Explain with an example. 5
- (b) Write a loop that calculates the sum of n elements of the following series :  
 $1 + 4 + 7 + 10 + 13 \dots$   
Use the loop during programming in the following two different ways : 10
- (i) Using while loop
- (ii) Using do-while loop
- (c) What do you mean by scope of a variable? Differentiate between global and local variables giving an example of each. 5
3. (a) Write a program in 'C', using structures to generate a report for n students which displays the Roll No., Class, Subjects, Marks, Total, Grade, etc. Assumptions can be made wherever necessary. 10

- (b) Write a program in 'C' to print the following output 'n' rows. For example, if  $n = 3$ , the following should be output by the program :

10

```
 1
 1 2 1
1 2 3 2 1
 1 2 1
 1
```

4. (a) Explain the meaning and usage of each of the following function prototypes :  $5 \times 2 = 10$

- (i) getch( )
- (ii) strcmp( )
- (iii) getchar( )
- (iv) gets( )
- (v) puts( )

- (b) Write a program to multiply 2 matrices of size  $3 \times 3$ . 10

5. (a) A 'C' program contains the following declaration :

`int arr [3] [2] = {{3, 1}, { 4, 1}, {3, 2}};`

What is the meaning of the following :  $1 \times 5 = 5$

- (i) `*(arr + 1)`
- (ii) `* (* (arr) + 2) + 1`
- (iii) `* (* (arr) + 1)`
- (iv) `arr`
- (v) `(* (arr) + 1) + 1`

(b) Write a recursive program in 'C' to check whether a given string is a palindrome or not.

10

(c) Explain the syntax of switch case statement in 'C' language. Also compare the performance of *switch case* with *if else* statement.

5

---

**MCA (Revised) / BCA (Revised)**

**Term-End Examination**

**December, 2015**

**MCS-011 : PROBLEM SOLVING AND  
PROGRAMMING**

*Time : 3 hours*

*Maximum Marks : 100*

*(Weightage 75%)*

---

**Note :** *Question number 1 is **compulsory**. Answer any **three** questions from the rest.*

---

1. (a) Draw a flowchart and write a program in 'C' to implement binary search in a given list of numbers. 10
- (b) Explain the concept of dynamic memory allocation with an example. 10
- (c) Write a program in 'C' to find all Armstrong numbers in the range of 0 and 999. 10

*Hint :* An Armstrong number is an integer such that the sum of the cube of its digits is equal to the number itself, e.g. 153 is an Armstrong number.

- (d) Explain the use of the following data types with an example for each : 10
- (i) enumerated data type
  - (ii) type def
2. (a) Without using the 'strcpy' function write a program to copy the contents of string 2 to string 1, and find the length of the copied string using pointers. 10
- (b) Explain the relational operators in 'C' with an example for each. 5
- (c) What is type conversion ? What are the different ways of type conversion ? Explain with an example for each. 5
3. (a) Explain the use of the following statements with an example for each : 10
- (i) Goto
  - (ii) Break
  - (iii) Exit
  - (iv) Continue
- (b) Design an algorithm and draw a corresponding flowchart to convert a decimal number into an octal number equivalent. 10

4. (a) Write a program in 'C' to display the following output :

10

```

 1
 2 2 2
3 3 3 3 3
4 4 4 4 4 4 4
 3 3 3 3 3
 2 2 2
 1
```

- (b) Explain the following with examples :  $4 \times 2 \frac{1}{2} = 10$

- (i) Unary operators in 'C'
- (ii) Multidimensional Array
- (iii) Syntax and Semantic errors
- (iv) Size operator

5. (a) Write a program in 'C' to copy the content from one file to another file.

10

- (b) What is pointer-to-pointer ? Explain the need of pointer-to-pointer with an example. Also show how the address of variable in this case is calculated and determined.

10

---



**MCA (Revised) / BCA (Revised)**

**Term-End Examination**

**June, 2016**

12106

**MCS-011 : PROBLEM SOLVING AND  
PROGRAMMING**

*Time : 3 hours*

*Maximum Marks : 100*

*(Weightage 75%)*

---

**Note :** *Question no. 1 is compulsory. Attempt any  
three questions from the rest.*

---

1. (a) Explain how you will analyse the efficiency of an algorithm. 10
- (b) Design a flow chart and write an algorithm to calculate the factorial of a given number using recursion. 10
- (c) Explain the concept of pointer to an array. Using this write an interactive program in "C" to find out the string length of a given string, as input. 10
- (d) Write a program in "C", using structures, to calculate the Gross income and Net income if the Attendance, Basic pay, Grade pay, Deductions and Allowances are given as input. 10

2. (a) Write a program to read the full-name from the keyboard and display its corresponding short name. 10

Ex : I/P : ANIL KUMAR GULATI

O/P : A K GULATI

- (b) Write a program to display the string "UNIX" in the following format : 10

U  
UN  
UNI  
UNIX  
UNIX  
UNI  
UN  
U

3. (a) What is the use of "continue" statement and explain it with the help of an example ? 5

- (b) Explain any four string functions with an example for each. 10

- (c) How will you write a function *with no arguments and with return value* ? Also, write an example function – definition for this. 5

4. (a) Write a program to swap two values of variables, using pointers. 10
- (b) Write a program, using structures to read and display data for 10 students. 10

*Hint : Assumptions can be made wherever necessary.*

5. (a) Write a *macro* to display the string "COBOL" in the following format : 10

C  
CO  
COB  
COBO  
COBOL  
COBOL  
COBO  
COB  
CO  
C

- (b) Write a program to multiply two matrices of size  $M \times N$  and  $N \times P$  respectively. 10

\_\_\_\_\_

**MCA (Revised) / BCA (Revised)**

**Term-End Examination**

**December, 2016**

05076

**MCS-011 : PROBLEM SOLVING AND  
PROGRAMMING**

*Time : 3 hours*

*Maximum Marks : 100*

*(Weightage 75%)*

---

**Note :** *Question no. 1 is compulsory. Attempt any three questions from the rest.*

---

1. (a) Give the structure of a C program. Develop an algorithm, a flow chart and a program to add "n" numbers and find their average. 10
- (b) Write a C program to illustrate how the marks of 10 students are read in an array and then used to find the maximum marks obtained by a student in the class. 10
- (c) Using pointers, write a C program to find out the position and address of the first occurrence of any character given as input in a string. 10
- (d) Write a program, using files, to copy the contents of one file to another with a different file name. 10

2. (a) Write a program to initialize 3 names in an array of strings and display them. 5
- (b) What is Call By Value ? Give an example. 5
- (c) Explain function prototypes with an example for each. 10
3. (a) Write a program to print the first 10 even numbers using "goto" statement. 10
- (b) Write a program to read two strings and append the second string to the first string, using arrays. 10
4. (a) Write a program to swap the values using the Pass by Value and Pass by Reference methods, separately. 10
- (b) Write a program to test whether the given string is a palindrome or not. 10
5. (a) What is a macro ? Write a macro to demonstrate #define, #if, #else preprocessor commands. 10
- (b) Write a program using fread( ) and fwrite( ) to create a file of records and then read and print the same file. 10
-

**MCA (Revised) / BCA (Revised)**

00419

**Term-End Examination**

**December, 2016**

**MCS-011(S) : PROBLEM SOLVING AND  
PROGRAMMING**

*Time : 3 hours*

*Maximum Marks : 100*

*(Weightage : 75%)*

---

**Note : Question no. 1 is compulsory. Attempt any  
three questions from the rest.**

---

1. (a) Design a flow chart and write an algorithm to calculate the sum of all the digits of a 4-digit number. 10
- (b) Write a C program to find the largest and the smallest numbers in a given single dimensional array of "n" numerical values. 10
- (c) Write a C program to compute the age of a person by taking the current date and the date\_of\_birth as inputs. 10
- (d) Write macro definitions for the following : 10
  - (i) To find the AREA of a circle ( $\pi \times r^2$  where  $\pi = 3.14$ )
  - (ii) To find the PERIMETER of a rectangle (2 length + 2 breadth)

- (iii) To find the AREA of a rectangle  
(length  $\times$  breadth)
- (iv) To find the PERIMETER of a square  
(4  $\times$  side)
- (v) To find the AREA of a square  
(side  $\times$  side)
2. (a) What is the use of **malloc ( )** function ?  
Illustrate it with the help of a program  
segment. 4
- (b) Write any four string functions and explain  
their usage with example program  
segments. 8
- (c) Write a C program to read formatted data  
(Act\_No, CName, Balance) from a file and  
print the information of all the customers  
whose balance is equal to and more than  
₹ 1,000. 8
3. (a) In C programming, what is the use of  
switch-case statement ? What are the rules  
associated with it ? Give the complete  
syntax and illustrate it with an example  
program segment. 10
- (b) Write a function in C to sort an array of  
integers in ascending order. 10

4. (a) Using pointers, write a C program to test whether the given string is a palindrome or not. 10
- (b) Define recursion. Write a C program to find the factorial of a given number using recursion. 10
5. (a) Summarize the purpose of the format strings “%f, %s, %d, %c”, which are commonly used with the printf and scanf functions with the help of an example for each. 10
- (b) When can we find the product of 2 matrices ? Also, write a program in C to find the product of 2 matrices (A, B) and store the result in matrix C. 10
-



**MCA (Revised) / BCA (Revised)**

**Term-End Examination**

11020

June, 2017

**MCS-011 : PROBLEM SOLVING AND  
PROGRAMMING**

*Time : 3 hours*

*Maximum Marks : 100*

*(Weightage 75%)*

---

**Note :** *Question no. 1 is compulsory. Attempt any three questions from the rest.*

---

1. (a) Design an algorithm and draw a corresponding flow chart to convert a decimal number to its binary equivalent. 10
- (b) Write a C program (use a switch statement for selection) to add or subtract 2 matrices having order  $3 \times 3$ , depending upon the choice made by the user. 10
- (c) Write and explain the following types of functions with the help of an example program for each : 10
  - (i) Function with no arguments and no return value.
  - (ii) Function with arguments and no return value.

- (d) Using pointers, write a C program to swap the values of two variables. 5
- (e) Mention the rules for using the Big-O notation. 5
2. (a) Without using the inbuilt string functions like `strcat( )` and `strlen( )`, write C programs for the following : 10
- (i) To concatenate 2 strings
  - (ii) To find the length of any given string
- (b) Define the term 'variable'. What are the rules to be followed to name a variable in "C" ? Write the syntax to declare a variable and also mention how to assign values to it (initialize them). 10
3. (a) Write a program in "C", using structures, to find the sum of the Assignment and Term End Exam marks (for IGNOU MCA or BCA first semester courses) for 5 students. 10
- (b) Explain the concept of "file handling" in C programming. Explain the use of `fopen( )` and `fclose( )` functions associated with it. Also mention various modes in which a file can be allowed to open with an example for each. 10

4. (a) Explain different arithmetic, logical and relational operators in C, with the help of examples. 10
- (b) Write and explain the use of the following in C programming, with an example for each : 10
- (i) Break statement
  - (ii) Continue statement
  - (iii) malloc ( )
  - (iv) void
5. Explain the following with the help of suitable example for each :  $4 \times 5 = 20$
- (a) Automatic Variables
  - (b) Global Variables
  - (c) Static Variables
  - (d) Register Variables
-

**MCA (Revised) / BCA (Revised)**

**Term-End Examination**

04770

**December, 2017**

**MCS-011 : PROBLEM SOLVING AND  
PROGRAMMING**

*Time : 3 hours*

*Maximum Marks : 100*

*(Weightage : 75%)*

---

**Note :** Question no. 1 is **compulsory**. Answer any **three** questions from the rest.

---

1. (a) Write an algorithm and draw corresponding flow chart to check whether the given number is prime or not. 10
- (b) Write a program to search an element in a given list of elements using linear search. 10
- (c) Differentiate between a macro and a function. To illustrate, write a macro and a function to swap values of 2 variables x and y. 10
- (d) Write a program to read a file and count the number of lines in the file. 10

**Note :** Should not use an in-built function.

2. (a) What are Linker errors ? Also explain Logical and Runtime errors. 10
- (b) Using structures, write a C program to calculate the Gross salary and Net salary, if Basic, Grade Pay, TA and DA are given. Deductions like Loans, Tax, LIC, etc. need to be considered, if any. 10
- Note : Assumptions can be made wherever necessary and list them.*
3. (a) Explain For loop and Do loop control statements with an example for each. 10
- (b) Explain any four string functions with an example for each. 10
4. (a) Explain the categories of functions. Also illustrate a "function with arguments and has no return value". 10
- (b) What is Recursion ? Write a program to find the factorial of a number. 10
5. (a) What are Unions ? Give an example code segment to initiate a union and to access a member of a union. 10
- (b) Write a program to test whether the given string is a number palindrome or not. 10

**MCA (Revised) / BCA (Revised)**

**Term-End Examination**

03515

**June, 2018**

**MCS-011 : PROBLEM SOLVING AND  
PROGRAMMING**

*Time : 3 hours*

*Maximum Marks : 100*

*(Weightage : 75%)*

---

**Note :** Question no. 1 is compulsory. Answer any  
*three questions from the rest.*

---

1. (a) Write an algorithm and draw the corresponding flowchart to calculate the factorial of a given number. 10
- (b) Write a program to find the maximum marks among the given marks of 10 students. 10

- (c) Write a macro to display string "Cobol" in the following pattern :

10

```
C
C O
C O B
C O B O
C O B O L
C O B O L
C O B O
C O B
C O
C
```

- (d) Write a program to copy the file contents of file1 to another file, file2. Write the complete program using files concept of C programming.

10

2. (a) Define a pointer. How is a pointer variable different from an array ? Illustrate the pointers concept with the help of a program in C.

10

- (b) Write a program to calculate an air ticket fare after discount, given the following conditions :

If passenger is

- (i) below 14 years then there is 50% discount on fare.
- (ii) above 50 years, 20% discount.
- (iii) above 14 and below 50 then 10% discount only.

10

**Note :** Assumptions can be made wherever necessary and list them.

3. (a) Explain **GOTO**, **BREAK** and **CONTINUE** statements with an example for each. 10
- (b) Write a program to find the string length without using **strlen()** function. 10
4. (a) Explain function call by reference. What are the advantages and disadvantages of it ? Illustrate with the help of a code segment written in C. 10
- (b) Write a program in C to take the marks of 4 courses (TEE and Assignments individually for each) and calculate the Total, Percentage and Grade. 10

Note : 40% is the pass marks for each component (TEE and Assignments) of a course.

Grade : A – Distinction – More than 75%  
B – Very Good – 60% to 74.9%  
C – Good – 50% to 59.9%  
D – Average – 40% to 49.9%  
E – Unsuccessful – Less than 40%



5. (a) Write a program in C language to multiply two matrices A and B of size  $3 \times 3$ . 10

(b) Differentiate between sequential and random access files. 5

(c) Write short notes on the following :  $2 \times 2 \frac{1}{2} = 5$

(i) 3-dimensional arrays and their significance.

(ii) Ternary operator with an illustration.

---

**MCA (Revised) / BCA (Revised)**

**Term-End Examination**

**December, 2018**

05043

**MCS-011 : PROBLEM SOLVING AND  
PROGRAMMING**

*Time : 3 hours*

*Maximum Marks : 100*

*(Weightage : 75%)*

---

**Note :** *Question no. 1 is compulsory. Attempt any three questions from the rest.*

---

1. (a) Write an algorithm to find the highest marks obtained by student(s) in "C programming" in a batch of 10 students. Also draw flow chart for this algorithm. 10
- (b) Write a C program which takes a string as input and displays its length. (Do not use built-in strlen function). 10
- (c) Write a program to swap the values of two variables using 10
  - (i) Pass by value method, and
  - (ii) Pass by reference method.

- (d) What is the difference between a structure and a union ? Write the syntax for declaration of a union, initializing the elements of union and also accessing its members in the program. 10
2. (a) Write a C program to copy the contents of a file into a newly created file (Use file handling concept). 10
- (b) Write a C program using recursive function to find the factorial of a given number. 10
3. (a) Write a C program to add two matrices of size  $3 \times 3$ . 10
- (b) What is a pointer ? With the help of a program to find the square of a number, explain how a function returns a pointer. 10
4. (a) Write a macro to evaluate  $f(x) = 2x^2 + 3x + 5$ . 5
- (b) Write a program to take two strings as input and append the second string to the first string using array. 10
- (c) Explain the use of malloc(), calloc() and realloc() and write their syntax. 5

5. (a) Using structures, write a C program to calculate the Gross salary and Net salary, if Basic pay, Grade pay, TA and DA and other allowances and deductions are given as inputs. 10
- (b) Explain the following with the help of a suitable example for each :  $4 \times 2 \frac{1}{2} = 10$
- (i) if statement
  - (ii) nested if statement
  - (iii) switch statement
  - (iv) for loop
-

70582

No. of Printed Pages : 3

MCS-011

**MCA (Revised)/BCA (Revised)**  
**(MCA/BCA)**

**Term-End Examination**

**June, 2019**

**MCS-011 : PROBLEM SOLVING AND  
PROGRAMMING**

*Time : 3 Hours*

*Maximum Marks : 100*

*(Weightage : 75%)*

---

*Note : Question No. 1 is compulsory. Answer any  
three questions from the rest.*

---

1. (a) Write an algorithm to find largest and smallest number among three numbers given as input. Also draw flowchart for this algorithm. 10
- (b) Explain the use of *break* and *continue* statements with the help of a program. 10
- (c) Write a program to generate the following pattern : 10

1

1 2

1 2 3

1 2 3 4

1 2 3 4 5

**(A-4) P. T. O.**

- (d) Write a menu-driven program using switch statement to perform the following arithmetic operations on *two* variables : 10
- (i) Add
  - (ii) Subtract
  - (iii) Multiplication
  - (iv) Division
2. (a) Write a C program using array of pointers to strings to read name of your five friends and display them. 10
- (b) Write a C program to calculate simple interest. If principal amount, rate of interest and duration are given as input. 10
- $$\left( \text{Note : SI} = \frac{P \times R \times T}{100} \right)$$
3. (a) Write a C program to create two matrices A and B of size  $3 \times 3$  and find  $A \times B$ . 10
- (b) Explain the following with the help of an example for each : 10
- (i) Static variable
  - (ii) Global variable
  - (iii) Register variable
  - (iv) Local variable

4. (a) Write a C program to create a macro to evaluate : 5

$$f(x) = 3x^3 + 2x^2 + x$$

- (b) Write a C program which display the number of lines in a given file. 10
- (c) Define recursion. With the help of a small C program segment and explain it. 5
5. (a) Explain the use of the following file functions :  $4 \times 2\frac{1}{2} = 10$
- (i) fseek()
  - (ii) rewind()
  - (iii) ftell()
  - (iv) fwrite()
- (b) Write a program to check whether a given string is a palindrome or not. 10

52124

No. of Printed Pages : 4

**MCS-011**

**MASTER OF COMPUTER  
APPLICATION (REVISED)/BACHELOR  
OF COMPUTER APPLICATION  
(REVISED) (MCA/BCA)  
Term-End Examination**

**December, 2019**

**MCS-011 : PROBLEM SOLVING AND  
PROGRAMMING**

*Time : 3 Hours*

*Maximum Marks : 100*

*Weightage : 75%*

---

***Note : Question No. 1 is compulsory. Attempt any  
three questions from the rest.***

---

1. (a) Write an algorithm and draw the corresponding flowchart to find the GCD (Greatest Common Divisor) of 2 given integers. 10
- (b) Write a program to reverse an input string using pointers. 10



- (c) Write a program using structures to find the Gross salary and Net salary for 5 employees of a small retail outlet if BASIC, TA, DA, HRA, Other Allowances and Deductions are given as input.

Where Gross Salary = BASIC + TA + DA + HRA + Other Allowances and Net Salary = Gross Salary - Deductions. 10

- (d) Write a program using File-Handling to count the no. of characters in a given .dat file. 10

2. (a) Compare while and do-while loop. Write a small code segment for each to explain the difference between them. 10

- (b) Give the C expressions for the following algebraic expressions : 10

(i) 
$$\frac{a * 4c^2 - d}{m + n}$$

(ii) 
$$ab - (e + f) \frac{4}{3}$$

3. (a) What are the use of the following along with their syntax and suitable example for each : 6

(i) Puts and Gets

(ii) Break Statement

(iii) Continue

- (b) Define a Variable. How are variables declared in C ? What are the rules to name a variable in C ? How to assign a value to the variable at the time of declaration ? Explain with suitable examples. 6

- (c) Explain with an example program code segment, the array of a structure. 8

4. (a) Write a program in C to find the largest and smallest number in an array of 100 integers. 10

- (b) Write a program to find out square and cube of a given number using macros. 6

- (c) What is a logical error in C ? Give an example of it. 4

5. (a) Explain the use of the following functions

in C :

$$4 \times 2 \frac{1}{2} = 10$$

(i) malloc()

(ii) fseek()

(iii) ftell()

(iv) realloc()

(b) Define an array. How are arrays declared and initialized ? Write a C program to add two matrices A and B of size  $3 \times 3$ . 10

No. of Printed Pages : 5

**MCS-011**

**M. C. A. (REVISED)/B. C. A. (REVISED)**  
**(MCA/BCA)**

**Term-End Examination**

**June, 2020**

**MCS-011 : PROBLEM SOLVING AND  
PROGRAMMING**

*Time : 3 Hours*

*Maximum Marks : 100*

*Weightage : 75%*

---

**Note :** (i) *Question No. 1 is compulsory.*

(ii) *Answer any three questions from the rest.*

---

1. (a) Give the equivalent C expression for the following algebraic expression :  $2 \times 3 = 6$

(i) 
$$\frac{a^2 b^3 c^4 - d^4}{e(m - n)}$$

(ii) 
$$xy - \left[ (p + q)^4 / r^2 \right]$$

**P. T. O.**

(b) Write a recursive function in C to generate a Fibonacci series. 6

(c) Write an algorithm and draw a corresponding flow chart to check whether the given number is prime or not. 8

(d) Write an interactive C program to perform the following operation on a  $3 \times 3$  matrix with appropriate validation checks : 10

$$C = A * B$$

(e) Explain the differences between static, auto, register and global variables with an example for each.  $2\frac{1}{2} \times 4 = 10$

2. (a) List the arithmetic, logical and relational operators in C. When  $a$ ,  $b$ ,  $c$  and  $d$  are integers and values of  $a$ ,  $b$  and  $c$  are 8, 6 and 4 respectively. Find the value of  $d$ , 8
- if  $d = a + (b - c) * a / c$

- (b) Write a program in C to generate the following pattern : 6

1

1 2

1 2 3

1 2 3 4

- (c) Differentiate between call-by value and call-by reference using an example program for each. 6
3. (a) Using pointers, write a program in C to count the no. of occurrence of each character in a given string. 10

Sample I/P : ARRANGE

O/P :

A - 2 times      G - 1 time

R - 2 times      E - 1 time

N - 1 time

- (b) Write a C program to calculate the income tax for 5 employees if name of the employee, designation, department and annual salary is given as per the following slab-rate : 10

Below 5 lakhs : No tax

Above 5 lakhs and : 10% tax on  
below 7 lakhs annual income

Above 7 lakhs and : 20% tax on  
below 10 lakhs annual income

Above 10 lakhs : 30% tax on  
annual income

4. (a) Using file handling concept, write a C program to read a file and count the no. of lines in the file. 10

- (b) What are Unions ? Give an example code segment to initialize a union and to access a member of a union. Mention the difference between a structure and a union.

10

5. (a) Explain the following conditional statements with an example for each : 10

- (i) If ..... else statement
- (ii) If statement
- (iii) Nested if ..... else statement
- (iv) Else ..... if ladder

- (b) Define a function in C. List and explain various categories of functions. Also, illustrate a function to find square root of a given number.

10



No. of Printed Pages : 4

**MCS-011**

**M. C. A. (REVISED)/B. C. A. (REVISED)**  
**(MCA/BCA)**

**Term-End Examination**

**December, 2020**

**MCS-011 : PROBLEM SOLVING AND  
PROGRAMMING**

*Time : 3 Hours*

*Maximum Marks : 100*

*Weightage : 75%*

---

**Note :** (i) Question No. 1 is compulsory.

(ii) Answer any **three** questions from the rest.

---

- 
1. (a) Write an algorithm and draw corresponding flowchart to find the largest number among 3 numbers given as input. 10
  - (b) Explain the conditional operator in C with the help of an example. Compare it with if...else statement. 5

- (c) Explain the following user-defined data types : 5
- (i) typedef
  - (ii) enum
- (d) What is the difference between a High-level language and a Low-level language ? Why C language is referred to as Middle-level language ? 5
- (e) Write a program using pointers, to swap the values of 2 variables. 5
- (f) Write a program using file-handling concept, to read and count the no. of characters in a .dot file. 10
2. (a) Explain type-cast and size-of operators in C with an example to each. 5
- (b) Write a C program to sort the given array of integers in ascending order, using any of the sorting algorithm. Explain the logic. 10
- (c) Define a preprocessor in C. How is it implemented ? Explain with the help of an example. 5

3. (a) Write a C program using structures, to find the total, average and grade for 5 students.

10

**Note :** Assumptions can be made wherever necessary and write them.

- (b) Write a program to : 10

- (i) Find the length of a string.  
(ii) Print the reverse of the string.

4. (a) Write a simple menu program, using *switch* statement to select an operator on two  $3 \times 3$  matrices : 10

- (i) Addition of two matrices  
(ii) Subtraction of 2 matrices

- (b) Write a C program to display the following pattern using “for” loop : 10

5

5 4

5 4 3

5 4 3 2

5 4 3 2 1

5. Write short notes on the following with the help of an example mentioning their use in the programs :  $10 \times 2 = 20$

- (a) getch( )
- (b) void( )
- (c) gets( )
- (d) ++ (increment operator)
- (e) -- (decrement operator)
- (f) % operator
- (g) break statement
- (h) # define
- (i) fseek( )
- (j) Goto statement

**MCA (Revised) / BCA (Revised)**

**Term-End Examination**

**June, 2021**

**MCS-011 : PROBLEM SOLVING AND  
PROGRAMMING**

*Time : 3 hours*

*Maximum Marks : 100*

*(Weightage : 75%)*

---

**Note :** Question no. 1 is **compulsory**. Answer any **three** questions from the rest.

---

1. (a) Write an algorithm and draw a corresponding flow chart to check whether the given year is a leap year or not. 10
- (b) Write a C function **isodd(num)** that accepts an integer argument and returns 1 if the argument is odd and 0 otherwise. 4
- (c) Write a C program that invokes this function to generate numbers between the given range. 6

- (d) Define an Array. How do we declare and initialize a single-dimensional array and a 2-dimensional array ? Explain with an example for each. 4
- (e) Write a C program to implement STRING COPY operation that copies a string “**str1**” to another string “**str2**” without using library function. 8
- (f) Write a C program to maintain a record of “n” student details using an array of structures with structure-variables (Rollnumber, Name, Marks1, Marks2, Marks3, Marks4 and Grade). Define each field of the structure with appropriate datatype. Print the marks of the student of given Rollnumber as input. 8
2. (a) Discuss dynamic memory allocation in C. Write and explain dynamic allocation functions in C. 6
- (b) Write and explain any two pre-processor directives in C. 4
- (c) Write a C program to find the sum of diagonal elements of a  $3 \times 3$  matrix. 10
3. (a) Write a C program to create a file of numbers given by the user and copy odd numbers to odd.dat file and even numbers to even.dat file. 10
- (b) *Using recursion*, write a C program to find the factorial of a given number. 10

4. (a) Write a function to print the sum of the following series :

$$1 + 2^2 + 3^3 + \dots + n^n$$

where “n” is passed as an argument to the function.

8

- (b) Write a program to calculate the number of vowels (a, e, i, o, u) separately in the entered string and display their individual count.

12

5. (a) Write two differences between a structure and a union with appropriate examples.

4

- (b) Write a C program to find the substring in a string without using a library function.

10

- (c) Write a program to delete an element from a given location of an array of integers.

6

---

No. of Printed Pages : 4

**MCS-011**

**MASTER OF COMPUTER  
APPLICATIONS (REVISED) (MCA)**

**Term-End Examination**

**December, 2021**

**MCS-011 : PROBLEM SOLVING AND  
PROGRAMMING**

*Time : 3 Hours**Maximum Marks : 100**Weightage : 75%*

---

**Note :** Question No. 1 is compulsory. Answer any  
**three** questions from the rest.

---

1. (a) Write an algorithm to convert a decimal number to its equivalent hexadecimal number. Also draw its corresponding flowchart. 10
- (b) Write a program to generate Fibonacci series using recursion. 10

- (c) What are the rules of using Big-O notation ? How the performance of the algorithms are measured ? 10
  - (d) Write a program to search an element in a given list of 20 elements using linear search. 10
2. (a) Write a program to take a list of N numbers, separate even and odd numbers and put them in two separate files (even\_file and odd\_file). Use file handling concept. 10
  - (b) Write a program to perform the following operation on matrices :

$$D = A + (B * C)$$

where A, B and C are matrices of  $3 \times 3$  size and D is the resultant matrix. 10

3. (a) Write a program to convert lower case letters to upper case in a given string. 5
- (b) Explain switch statement with the help of a program segment. Also write its syntax.



[ 3 ]

MCS-011

[ 4 ]

MCS-011

- (c) Write a program to award grades to students depending upon the criteria mentioned below : 10

Marks less than 40, 'E' grade.

Marks above 40 but less than 50, 'D' grade.

Marks above 50 but less than 60, 'C' grade.

Marks above 60 but less than 75, 'B' grade.

Marks greater than 75, 'A' grade.

4. (a) Write a program to demonstrate passing a structure to a function. 5
- (b) Write a program to evaluate the following :

5

$$c = a^b.$$

- (c) What are global variables and static variables ? Explain with the help of an example. 5
- (d) How '# define' is used to create functional macros ? Illustrate with the help of a C program segment. 5

5. (a) Write a program to concatenate two strings without using the strcat() function. 10

- (b) Differentiate between sequential and random access files. 5

- (c) Write short notes on the following : 5

(i) Structure

(ii) Union

MCS-011

P. T. O.

**MCA (Revised) / BCA (Revised)**  
**Term-End Examination**  
**June, 2022**

**MCS-011 : PROBLEM SOLVING  
AND PROGRAMMING**

*Time : 3 hours*

*Maximum Marks : 100*

*(Weightage : 75%)*

---

**Note :** *Question no. 1 is **compulsory**. Answer any **three** questions from the rest.*

---

1. (a) Draw a flowchart and write an algorithm to calculate the factorial of a given number. 10

(b) Write a program to display string 'INFINITY' in the following pattern (using "LOOP" control statement) : 10

I  
IN  
INF  
INFI  
INFIN  
INFINI  
INFINIT  
INFINITY

- (c) Write a program to generate Fibonacci series using recursion. 10
- (d) Write an interactive C program for each to illustrate the following concepts : 10
- (i) Enumerated data type
  - (ii) Macros in C
  - (iii) Typedef
  - (iv) Goto statement
2. (a) Write an algorithm and draw the corresponding flowchart to calculate whether the given number is prime or not. 10
- (b) Write a C program to perform the following operation on matrices :
- $$D = (A*B) + C$$
- where A, B and C are matrices of  $3 \times 3$  size and D is the resultant matrix. 10
3. (a) Write a program to find the minimum marks among the given marks of 20 students. 10
- (b) Write a program to find the string length without using strlen( ) function. 10

4. (a) Define function. How are functions declared in C language ? What are function prototypes and what is the use of **return** statements ? 10
- (b) Explain the function “call by reference” in C language. Give advantages and disadvantages of it. 10
5. (a) Explain the following statements with the help of an example for each : 10
- (i) Break
- (ii) Goto
- (iii) Continue
- (b) Using File Handling Concept, write a program to copy one file to another. 5
- (c) Write a short note on Ternary Operator with an illustration. 5
-

No. of Printed Pages : 3

**MCS-011**

**MASTER OF COMPUTER  
APPLICATIONS (REVISED)/  
BACHELOR OF COMPUTER  
APPLICATIONS (REVISED)  
(MCA/BCA)**

**Term-End Examination**

**December, 2022**

**MCS-011 : PROBLEM SOLVING AND  
PROGRAMMING**

*Time : 3 Hours*

*Maximum Marks : 100*

*Weightage : 75%*

---

**Note :** *Question No. 1 is compulsory. Answer any  
three questions from the rest.*

---

1. (a) Write an algorithm to find highest and lowest marks obtained by students of batch size 10. Also draw a flowchart for this algorithm.

10

**P. T. O.**

- (b) Write a recursive program/function in C to find factorial of a given number between 1 to 10. 10
- (c) Write a program in 'C' to sort an array of 10 elements in ascending order. 10
- (d) Explain difference between 'call by value' and 'call by reference' with the help of examples. 10
2. (a) What is Union ? How is it different from structure ? Explain declaration and use of union in C with the help of an example and program. 10
- (b) Write a C program to find the average of diagonal elements of a matrix of  $6 \times 6$ . 10
3. (a) Write the syntax and explain the use of the following functions in C : 10
- (i) malloc
  - (ii) fputc
  - (iii) strcat
  - (iv) fclose
- (b) Write a C program using pointers to find whether a given string is palidrome or not.

4. (a) Write a 'C' program to copy a given string into another string without using inbuilt function. Also display the length of the resultant string. 14

- (b) Explain the use of the following statements with the help of an example :  $3 \times 2 = 6$

(i) Switch statement

(ii) Else-if statement

- (c) Write a macro to evaluate : 4

$$f(x) = 5x^3 + 2x + 3$$

5. (a) Write a program to display the following pattern : 6

1 2 3 4

5 6 7

8 9

- (b) Write C program to swap two given values.

4

- (c) Write C program to open an existing file "My.TXT" and read its content and display it. 10

No. of Printed Pages : 4

**MCS-011**

**MASTER OF COMPUTER  
APPLICATIONS/BACHELOR OF  
COMPUTER APPLICATIONS  
(REVISED) (MCA/BCA)**

**Term-End Examination**

**June, 2023**

**MCS-011 : PROBLEM SOLVING AND  
PROGRAMMING**

*Time : 3 Hours*

*Maximum Marks : 100*

*Weightage : 75%*

---

***Note : Question No. 1 is compulsory. Answer any  
three questions from the rest.***

1. (a) Write an algorithm to calculate simple interest. Also draw flow chart for this algorithm (**Hint :  $SI = (PTR)/100$** ). 10
- (b) Write a C program to create a structure to store name, rollnumber, address and course (BCA, MCA) of ten students. Use array of structure to display details of the students.

**P. T. O.**



10

- (c) Write a C program which read an array of ten integer values and search a given value in the array. If that value exist in the array display its square otherwise display. "The value is missing." 10
- (d) Write a program in 'C' using printers to find the length of a given string. 10
2. (a) Write a C program to find the sum of the following series upto 20 terms : 6
- 1 + 4 + 7 + 10 + 13 .....
- (b) Briefly explain *two* categories of constants in C. 4
- (c) Write a C program for multiplication of two  $4 \times 4$  matrices. 10
3. (a) Explain the difference between `a++` and `++a`. Also find the value that would be printed by the following code : 6
- ```
int a = 4;
int b = 2;
int c = 0;

a = c++;
a = a + b++;
printf("a = %d", a);
```

- (b) Explain the use of conditional operator with the help of an example. 4
- (c) What is for loop ? How is it different from do while loop ? Explain with the help of an example. Also explain use of “break statement”. 10
4. (a) Write a ‘C’ program, using structures, to calculate the gross salary and net salary if Basic, D. A., T. A. and deduction are given as input. 10
- (b) Write the syntax and explain the use of the following functions in C : $2 \times 4 = 8$
- (i) return
 - (ii) malloc
 - (iii) isupper
 - (iv) fclose
- (c) Define a macro to find the cube of a given number. 2
5. (a) Write C program which take a string as input and print it in reverse order, without using any in-built function. 5

- (b) Write a C program to check whether a file whose name is given exist or not in the given list of file names. 5
- (c) Explain the following with the help of a suitable example for each : $4 \times 2\frac{1}{2} = 10$
- (i) File access modes
 - (ii) Array of pointers
 - (iii) Automatic variable
 - (iv) Size of operator