No. of Printed Pages : **3**

MCS-011

09486

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 prefered 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**

No. of Printed Pages : 3

MCS-011

09461

MCA (Revised)

Term-End Examination

December, 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 are different basic data types in C ? Explain the need of different numeric data types with example of each. **10**

(b) Given the sizes of three different sides, write a C program to find whether a triangle can be formed or not. **5**

(c) What are the logical operators in C ? Explain how they can be used for constructing the logical expressions ? **5**

(d) What is an array ? Write a C program using array to find largest and smallest number from a list of 100 given numbers. **5**

(e) Write a C program using *switch* to determine, whether the root of a quadratic equation is real or not. 5

(f) Differentiate between call by value and call by reference using example program. 10

2. (a) Write a function subs(s, n) in C, which prints the first n-characters of the string s provided n is less than the length of the string. 5

(b) Write a program in C to display the string "ARRAY" in the following format : 5

A

AR

ARR

ARRA

ARRAY

(c) What is union ? How it is different from structure ? Explain. How a union is declared in C ? Also write a program in C to show use of union. 10

3. (a) Explain the differences between static and auto variables, with example of each. 5

(b) Write a C program using pointer to reverse a given string. 10

(c) Explain the syntax of do-while statement. Also differentiate do-while from while statement. **5**

4. (a) What is recursion ? Write a C program using recursion to print the Fibonacci series upto a given number. **10**

(b) Write a C program using array to find the average price of apples and oranges, in ten cities in the country. **10**

5. (a) Write a C program to store string "This is my file" in a file. **10**

(b) What is pointer to pointer ? Explain need of pointer to pointer with an example. Also show how address of variable in this case is calculated/determined ? **10**

No. of Printed Pages : 3

MCS-011

MCA (Revised)

Term-End Examination

June, 2012

11597

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. Mention those features of 'C' which enables this description. Give a short note on the 'compilation' process in 'C'. **10**

(b) Develop a flowchart and then write a program in 'C' to sort strings passed to the program through command line arguments. Also display the sorted strings. **10**

(c) Define 'pointers' in C. How is a Pointer variable declared ? Give examples and explain. Enumerate the utility of Pointer variables, with an example. **10**

(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**

$(x) + (x+n) + (x+n^2) + (x+n^3) + \ldots\ldots\ldots$

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.

No. of Printed Pages : 3

MCS-011

14025

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**

No. of Printed Pages : 3

MCS-011

MCA (Revised)

Term-End Examination

June, 2013

05644

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) $\dfrac{ab^4c^2 - d}{m - n}$

(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 3×3 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 *strupp* ? 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) f tell ( )

(v) str cpy ( )

(b) Differentiate Sequential and Random Access files. 4

(c) Explain briefly null pointer assignment. Write a program in C to illustrate this concept. 6

No. of Printed Pages : 3

MCS-011

14745

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 3×3. **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) $\dfrac{(a+b)^4 c^2 - d \times e}{m+n}$

(ii) $ab + (e-f)^4 \Big/ (c \times d)$

(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 3×3 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)	malloc( )	(ii)	fopen( )
(iii)	fgets( )	(iv)	strcat( )
(v)	fputc( )	(vi)	fclose( )

No. of Printed Pages : **2**

MCS-011

13679

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 ? Explain with an example. **5**

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

(c) How will you write a function with no arguments and with return value ? Give an example. **5**

4. (a) Write a program to swap two values, using cell-by-value method. **10**

(b) Write a program in C to multiply two matrices A and B. **10**

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

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

(b) Define a macro to find maximum among of 3 given numbers using # ifdef, # else. **10**

No. of Printed Pages : 2

MCS-011

MCA (Revised) / BCA (Revised)
Term-End Examination
07464
December, 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) 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*

No. of Printed Pages : 4

MCS-011

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 ....

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 : *5×2=10*

(i) getch( )

(ii) strcmp( )

(iii) getchar( )

(iv) gets( )

(v) puts( )

(b) Write a program to multiply 2 matrices of size 3 × 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 : *1×5=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*

No. of Printed Pages : 3

15554

MCS-011

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*

No. of Printed Pages : 3

MCS-011

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
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
```

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

No. of Printed Pages : 2

MCS-011

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*

No. of Printed Pages : 3

MCS-011(S)

MCA (Revised) / BCA (Revised)
Term-End Examination
December, 2016

00419

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 × breadth)

(iv) To find the PERIMETER of a square (4 × side)

(v) To find the AREA of a square (side × 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*

No. of Printed Pages : 3

MCS-011

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 × 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 : *4×5=20*

(a) Automatic Variables

(b) Global Variables

(c) Static Variables

(d) Register Variables

No. of Printed Pages : 2

MCS-011

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*

No. of Printed Pages : 4

MCS-011

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 3×3. *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.

No. of Printed Pages : 3

MCS-011

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 3×3. *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

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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
```

(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 × 3 and find A × 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 palindrone 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 metrices A and B of size 3 × 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 : PBOBLEM 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) $\dfrac{a^2b^3c^4 - d^4}{e(m-n)}$

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

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