



ENGINEERING & MANAGEMENT EXAMINATIONS, DECEMBER - 2008

INTRODUCTION TO PROGRAMMING**SEMESTER - 1**

Time : 3 Hours]

[Full Marks : 70

GROUP - A**(Multiple Choice Type Questions)**

1. Choose the correct alternatives for the following :

10 × 1 = 10

i) By default, functions are assigned storage class.

a) auto

b) extern

c) static

d) register. ii) Maximum number of elements in the declaration `int arr [8] [5] ;` is

a) 40

b) 13

c) 3

d) 39.

iii) The default return type of any C function is

a) a character value

b) a decimal value

c) an integer value

d) void.

iv) When both global and local variables have the same name, will access the

a) local variable

b) global variable

c) compilation error

d) none of these.

v) A union is a collection of

a) heterogeneous elements

b) homogeneous elements

c) specific elements

d) none of these.



vi) How many times will the loop be executed ?

```
for(i=1;i<=10;i++)  
{  
    printf("\Hello");  
    i+=3;  
}
```

a) 10

b) 4

c) 3

d) none of these.

vii) Which of the following is not a relational operator ?

a) <

b) >

c) ||

d) <=

viii) Which operator is not a binary operator ?

a) +

b) ++

c) *

d) none of these.

ix) In C, size-of is

a) an operator

b) a function

c) a macro

d) none of these.

x) Array passed as an argument to a function is interpreted as

a) maximum number of elements that the array can hold

b) value of the first element of the array

c) address of the first element of the array

d) none of these.

**GROUP - B****(Short Answer Type Questions)**Answer any *three* of the following. $3 \times 5 = 15$

2. Draw a flow-chart of the factorial of a user given number. 5
3. Write a program to add the following series : 5
 $1 + 2/2! + 3/3! + \dots + n/n!$, value of n given by user.
4. Write short notes on continue and break statements. $2\frac{1}{2} + 2\frac{1}{2}$
5. What is loop ? Discuss various types of loop used in C. 5
6. What are Keywords and Identifiers ? What is Ternary operator ? $3 + 2$

GROUP - C**(Long Answer Type Questions)**Answer any *three* of the following. $3 \times 15 = 45$

7.
 - a) What do you mean by algorithm ?
 - b) Explain the properties of algorithm.
 - c) How does an algorithm differ from a pseudo-code ?
 - d) Design a flow-chart to find out the maximum of n numbers.
 - e) Illustrate decision table by a suitable example. $2 + 5 + 2 + 3 + 3$
8.
 - a) What do you mean by recursion ?
 - b) Write a recursive function in C to produce n^{th} Fibonacci number.
 - c) What are the major drawbacks of using recursion ?
 - d) What is preprocessor directive ?
 - e) Differentiate between function and macro in C. $3 + 4 + 2 + 2 + 4$



9. a) Why is nesting if-else loop used ?

b) What do you mean by high level language ?

c) What is string. h ?

d) Write down a C-program to find out the summation of following series :

$(1) + (1 + 2) + (1 + 2 + 3) + \dots + (1 + 2 + 3 + 4 + \dots + n)$

$2 + 2 + 1 + 10$

10. a) What is the difference between structure and union ?

b) What is global declaration ?

c) What is expression ?

d) Write a program which will merge the content of two files and copy into another blank file.

$2 + 2 + 1 + 10$

11. Discuss various operators used in C. Write a program in C to print all numbers between 100 and 200 which are divisible by 5 but not divisible by 15. 15

END

Name :
Roll No. :
Invigilator's Signature :



CS/BCA/SEM-1/BCA-103/2009-10

2009

INTRODUCTION TO PROGRAMMING

Time Allotted : 3 Hours

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*Candidates are required to give their answers in their own words
as far as practicable.*

GROUP - A
(Multiple Choice Type Questions)

1. Choose the correct alternatives for the following : $10 \times 1 = 10$

- i) A filter point is a
 - a) stream pointer
 - b) buffer point
 - c) pointer to FILE data type
 - d) all of these.
- ii) Which is not a storage class ?
 - a) auto b) struct
 - c) typedef d) static.
- iii) The declaration of float *a[5]; is
 - a) a normal pointer b) an ordinary array
 - c) an array of pointer d) a pointer to an array.

iv) How is a variable accessed from another file ?

- a) The global variable referenced via the global specifier
- b) The global variable is referenced via, the auto-specifier
- c) The global variable is referenced via the extern specifier
- d) The global variable is referenced via the pointer specifier.

v) `main ()`

```
{  
    int a = 3;  
    printf("%d%d%d%d",a++, ++a, ++a, a++);  
}
```

- a) 3566 b) 6653
- c) 3565 d) 6666.

vi) `main ()`

```
{  
    printf("%d%d%d",sizeof(3.14f),sizeof(3.14),sizeof(314))  
}
```

- a) 422 b) 421
- c) 482 d) 442.

vii) If the array begins at address 6548 ?

`main ()`

```
{  
    int a [ ] = { 12, 14, 15, 23 };  
    printf("%u%u",a,&a);  
}
```

- a) 6548 6558 b) 6548 6548
- c) 6548 6550 d) none of these.

viii) How many times the message *Hello* will be printed in the following program ?

```
void main ( )  
{  
    int x;  
    for(x=-1; x<=10; x++)  
    {  
        if (x<5)  
            continue;  
        else  
            break;  
        printf("Hello");  
    }  
}
```

- a) 11 times b) 10 times
c) once d) 0 times.

ix) What would be the correct output of the following program ?

```
void main ( )  
{  
    int k, num=30;  
    k=(num>5? (num<=10?100:200) : 500);  
    printf("%d%d",num,k);  
}
```

- a) 200 30 b) 30 100
c) 30 200 d) 30 500.

x) Choose the correct output :

```
void main ( )  
{  
    char str[20]="Hello";  
    char * const p=str;  
    *p='M';  
    printf("%s",str);  
}
```

- a) Mello b) Hello
c) HMello d) MHello.

GROUP - B

(Short Answer Type Questions)

Answer any *three* of the following. $3 \times 5 = 15$

2. a) What do you mean by Recursion ? Give example. 3
b) What are strings ? Explain with example. 2
3. a) Explain the difference between structure & union with examples. 4
b) What is Pointer ? 1
4. Using pointer write a program to find out length of the given string without using strlen () function. 5

5. Write a program to check whether a given string palindrome or not. 5
6. What do you mean by scope of a variable ? Explain the storage classes available in C. 2 + 3

GROUP - C**(Long Answer Type Questions)**Answer any *three* of the following.

3 × 15 = 45

7. What is structure ? How does a structure differ from any array ? What do you mean by call by value and call by reference ? Write a C program, which accepts an integer numbers and prints the multiplication of the digits. 2 + 2 + 2 + 2 + 7
8. a) What do you mean by malloc () and calloc () ? Explain their difference. 5
- b) Using pointer write a function that will calculate maximum and minimum of a given set of numbers. 7
- c) Write a recursive function that will calculate HCF of two numbers. 3

9. a) Explain `strcat ()`, `strcmp ()`, `strrev ()`, `strlen ()`.

b) Write C code to print

```
1
2 3
4 5 6
7 8 9 10
11 12 13 14 15
```

c) Write C code to print

```
A B C D E F E D C B A
A B C D E E D C B A
A B C C B A
A B B A
A A
```

2 + 6 + 7

10. a) What is a function ?

2

b) What do you mean by the following :

3

i) Function declaration

ii) Function calling

iii) Function definition.

c) When is it necessary to declare prototype of a function ?

3

d) Write a program to arrange a group of numbers into positive & negative numbers.

7

11. What is loop ? Discuss the different types of loops with syntax and appropriate examples. Write a program to print the summation of the following series :

$$1 + \frac{1}{2^2} + \frac{1}{3^2} + \frac{1}{4^2} + \dots + \frac{1}{N^2}$$

$$2 + 8 + 5$$

Name :

Roll No. :

Invigilator's Signature :

CS/BCA/SEM-1/BCA-103/2010-11

2010-11

INTRODUCTION TO PROGRAMMING

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as far as practicable.*

GROUP - A

(Multiple Choice Type Questions)

1. Choose the correct alternatives for the following :

10 × 1 = 10

- i) The operator & is used for
 - a) Bitwise AND
 - b) Bitwise OR
 - c) Logical AND
 - d) Logical OR.
- ii) Coercion is related to
 - a) Cast Operator
 - b) Binary Operator
 - c) Ternary Operator
 - d) All of these.
- iii) The size of a character variable in 'C' is
 - a) 4 bytes
 - b) 8 bytes
 - c) 16 bytes
 - d) None of these.
- iv) Data type of the controlling statement of a SWITCH statement cannot of the type
 - a) int
 - b) char
 - c) short
 - d) float.

- v) How long the following loop runs ?
for (x = 0; x = 3; x++)
a) Three times b) Four times
c) Forever d) Never.
- vi) The associativity of operator ++ is from
a) left to right b) right to left
c) both (a) and (b) d) none of these.
- vii) The CONTINUE statement cannot be used with
a) for b) switch
c) do d) while.
- viii) Output of the following program will be
main()
{
 Int d = 0;
 If(d=5)
 Printf("Right");
};
}
a) Right b) Wrong
c) WrongRight d) None of these.
- ix) Size of the following union (assume size of int=2; size of float=4 and size of char=1) is
union Jabb
{
 int a;
 float b;
};
a) 2 b) 4
c) 1 d) 6.
- x) File is a
a) data type b) region of storage
c) variable d) register.

GROUP - B

(Short Answer Type Questions)

Answer any *three* of the following. $3 \times 5 = 15$

2. Draw a flowchart that can check whether a supplied number is palindrome or not.
3. Write a program to convert binary number to its equivalent decimal number.
4. What is a symbolic constant ? What do you mean by conditional operator ? What do you mean by binary operator ? $2 + 2 + 1$
5. What is the difference between break and continue ? What is a block ? What is a statement terminator ? $2 + 2 + 1$
6. What is a null statement ? What are local variable and global variable ? What is a null string ? $1 + 3 + 1$

GROUP - C

(Long Answer Type Questions)

Answer any *three* of the following. $3 \times 15 = 45$

7. a) Write a C program to reverse an integer number without using `strrev()` and `strlen()`, subtract 9 from the reversed number and print the result. [For example, if the given number is 678, then its reverse is 876. Subtracting 9 will give 867.] 8
b) Describe the different classes of data types supported in C along with their keyword equivalent and sizes. 7
8. a) Write a program to print the series as given along with the sum : $1 - 2 + 3 - 4 + 5 - \dots n.$ 8
b) Define array. Write the syntax of different types of array along with examples. 7

9. a) What do you mean by NULL pointer ? In which header file is it defined ? How will you include that header file ? 1 + 1 + 1
- b) Write a program to reverse a given string of characters. You should not use `strrev()`. 6
- c) Write a program to multiply two matrices. 6
10. a) "C is a high level language." Comment on the statement critically. 3
- b) What is a preprocessor in C language ? What are directives ? Illustrate with examples. 3 + 3 + 3
- c) What is macro ? Give an example program to explain the working principle of macro. 3
11. a) What is a pointer ? What are the different characteristics of a pointer ? 2 + 3
- b) "Pass by address refers to the address of a variable passed as an argument to the called function." Justify the statement. 5
- c) Write a program to swap the values between two variables using pointers. 5
-

Name :

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CS/BCA/SEM-1/BCA-103/2011-12

2011

INTRODUCTION TO PROGRAMMING

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GROUP – A

(Multiple Choice Type Questions)

1. Choose the correct alternatives for any *ten* of the following :
 $10 \times 1 = 10$
 - i) Which of the following operators accepts only integer operands ?
 - a) +
 - b) *
 - c) /
 - d) %
 - ii) Do-While loop is called in C language.
 - a) entry controlled loop
 - b) exit controlled loop
 - c) both (a) and (b)
 - d) none of these.
 - iii) C supports the statement to branch unconditionally from one point to another in the program.
 - a) Continue
 - b) Break
 - c) Goto
 - d) Switch.

- iv) An array of string ends with
 - a) NULL
 - b) last character of the string
 - c) 0
 - d) none of these.
- v) The declaration of float *a[5]; is
 - a) a normal pointer
 - b) an ordinary array
 - c) an array of pointer
 - d) a pointer to an array
- vi) When the pointer is incremented by one, it results the pointer to
 - a) point the next element
 - b) increment its data value by one
 - c) both (a) & (b)
 - d) none of these.
- vii) Call by reference is done with the of the variable.
 - a) contents
 - b) address
 - c) both (a) and (b)
 - d) none of these.
- viii) Static memory allocation means allocation during time.
 - a) compile
 - b) run
 - c) allocation
 - d) de-allocation.

ix) The mode used for creating a text file for read/write is

(a) r+ (b) w+ (c) a+ (d) w

x) What should be the correct output of the following program ?

```
main ( )  
{  
    int k, num = 30;  
    k = ( num > 5 ? ( num < 10 ? 100 : 200 ) : 500 ) ;  
    printf ( "%d %d", num, k ) ;  
}
```

a) 200 30 b) 30 100
c) 30 200 d) 30 500.

xi) What is the value of y in the following code ?

```
 $x = 7$ ;  $y = 0$ ;  
if (  $x = 6$  )  
     $y = 7$  ;  
else  
     $y = 1$ ;
```

a) 7 b) 0
c) 1 d) 6.

xii) Determine the out put :

```
f()  
{  
static int i = 0;  
i++;  
if ( i <= 3 )  
{  
print f( "\n%d", i );  
f ( );  
}  
else  
exit ( 0 );  
}  
main ( ) { f ( ) ; }
```

- a) 1, 2 b) 2, 3
c) 1 2 3 d) None of these.

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. $3 \times 5 = 15$

2. a) What do you mean by local variable and global variable ?
b) Discuss on various available storage classes in C. $2 + 3$
3. What do you mean by recursion ? Write a recursive function called power () to calculate x rise to the power n . $2 + 3$

4. Compare array and linked list.
5. a) Distinguish between structure and union.
b) Write down the following program in C :

Input an M -digit number. Print its digit one by one.
(least significant but first) 2 + 3

6. Write a program to print the sum of the following series of n terms :

$$S = 1 + (1 + 2) + (1 + 2 + 3) + \dots$$

GROUP - C

(Long Answer Type Questions)

Answer any *three* of the following. $3 \times 15 = 45$

7. a) Do you have the facility of multiple way branching in C ? If so, how ? Explain your answer with an example. 5
b) Write down the differences between 'do-while' and 'while-do' statements in C. 5
c) What is a macro ? Write down the advantages of macro over function. 5
8. a) Give example of each of the following :
 - i) Function returning a pointer to an array of float.
 - ii) Function returning a pointer to a function returning float.

- iii) Pointer to pointer to integer
- iv) Pointer to an array of integers.
- v) Pointer to an array of pointers to a function
returning character. 5 × 2
- b) Discuss on call by value and call by reference. 5
- 9. a) Explain with examples the meaning of explicit and
implicit type casting. 5
- b) Compare between static memory allocation and
dynamic memory allocation. 5
- c) Write down program in C that will accept a string from
the user and print the frequency of each characters of
the string entered. 5
- 10. a) What do you mean by integer division in C? 3
- b) Write a note on logical operators available in C. 5
- c) Write down a program that will find out the maximum
and the minimum of the given set of n numbers (you
can examine the set of numbers only once). 7

11. Differentiate between any *three* of the following : 3×5

- a) Declaring a variable
 - b) Break and exit
 - c) Union and structure
 - d) auto and extern.
-

Name :

Roll No. :

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CS/BCA/SEM-1/BCA-103/2012-13

2012

INTRODUCTION TO PROGRAMMING

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GROUP – A

(Multiple Choice Type Questions)

1. Choose the correct alternatives for any *ten* of the following :

10 × 1 = 10

i) C is a

- a) middle level language
- b) high-level language
- c) low-level language
- d) none of these.

ii) A do-while loop is useful when we want that the
statements within the loop must be executed

- a) only once
- b) at least once
- c) more than once
- d) none of these.

- iii) Every C function
 - a) by default return an integer value
 - b) by default return more than one integer value
 - c) by default return an floating costant
 - d) none of these.
- iv) An array is a collection of
 - a) different data types scattered through memory
 - b) the same data type scattered throughout the memory
 - c) the same data type placed next to each other in memory
 - d) different data types placed next to each other in memory.
- v) When you pass an array as an argument to a function, what actually gets passed
 - a) address of the array
 - b) value of the elements of the array
 - c) address of the first element of the array
 - d) number of elements of the array.

- vi) What is a preprocessor directive ?
- a) A message from compiler to the programmer
 - b) A message from compiler to the linker
 - c) A message from programmer to the preprocessor
 - d) A Message from programmer to the microprocessor.
- vii) A header file is
- a) a file that contains standard library functions
 - b) a file that contains definitions & macros
 - c) a file that contains user defined functions
 - d) a file that is present in current working directory.
- viii) The break statement is used to exit from
- a) an if statement
 - b) a for loop
 - c) a program
 - d) the main () function.

ix) Which function would you use if a single key is to be received through the keyboard ?

- a) scanf()
- b) gets()
- c) getcha()
- d) getchar().

x) If $*p$ & $*q$ are two pointer variables, then which of the following statements are true

- a) $*p + *q$
- b) $*p/*q$
- c) $*p + 10$
- d) none of these.

xi) What is the output of the following programs ?

```
main()
{ int i = 1

    printf("%d%d%", i, ++i, i++ );

}
```

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

GROUP - B

(Short Answer Type Questions)

Answer any *three* of the following.

3 × 5 = 15

2. Describe the different symbols used in a flowchart with a suitable example. What do you mean by debugging of a program ?
4 + 1
3. Briefly describe the different loop control structures in 'C' with syntax, example and explanation.
4. What are the advantages of using functions in 'C' programming ? What is the difference between users defined functions & library functions ? What is recursion in programming ? What advantage is there in its use ?
2 + 1 + 1 + 1
5. What is dynamic memory allocation ? Why a linked list is called a dynamic data structure ? What are the advantages of using linked lists over arrays ?
1 + 2 + 2
6. What is structure ? How is a structure member accessed ? What is an array of structures described with an example ?
1 + 1 + 3

GROUP – C
(Long Answer Type Questions)

Answer any *three* of the following. $3 \times 15 = 45$

7. Explain the difference between 'call by reference' and 'call by value'. What is the difference between global & local variable. Write a recursive function for GCD calculation.

$5 + 3 + 7$

8. What do you mean by storage classes in 'C' ? Name different storage classes and explain each with examples. Write a 'C' program that implements the matrix multiplication using 2-D array.

$2 + 6 + 7$

9. What is linked list ? What are the advantages of switch case ? Describe different types of data types. Write a 'C' program to calculate factorial of a number.

$2 + 2 + 6 + 5$

10. What is union ? How does a union differ from a structure ? How a union member accessed ? Write a 'C' program that implements a structure person that would contain person name, data_of_joining & salary.

$2 + 3 + 2 + 8$

11. Write short notes on any *three* of the following : 3 × 5

- a) Preprocessor directives
 - b) strcpy() and strcmp () function
 - c) Automatic and static variables
 - d) getc() and getchar() function
 - e) Actual & formal arguments.
-

Name :

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CS/BCA/SEM-1/BCA-103/2013-14
2013

INTRODUCTION TO PROGRAMMING

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GROUP - A

(Multiple Choice Type Questions)

1. Choose the correct alternatives for the following : $10 \times 1 = 10$

i) Which of the following is a valid typecast ?

- | | |
|---------------|----------------|
| a) To(int, x) | b) X(int) |
| c) (int)X | d) (integer)X. |

ii) How many times is a do while loop guaranteed to loop ?

- | | |
|-------------|--------------|
| a) 0 | b) 1 |
| c) Infinite | d) Variable. |

iii) Which of the following operators represent logical AND ?

- | | |
|-------|---------|
| a) & | b) AND |
| c) && | d) . |

iv) Which of the following characters ends all strings ?

- | | |
|----------|-----------|
| a) '\\n' | b) '\\t' |
| c) '\\s' | d) '\\0'. |

- v) Which of the following is a complete function ?
- a) `int fn(int a){return a--;}`
 - b) `int fn();`
 - c) `int fn(int a){return a--}`
 - d) `int fn(int a){return a--};`
- vi) Which of the following adds one string to the end of another ?
- a) `append()`
 - b) `strcat()`
 - c) `strconcat()`
 - d) `stradd()`
- vii) Which is not the correct variable type in c ?
- a) `int`
 - b) `float`
 - c) `char`
 - d) `real`
- viii) What is the index number of the last element of an array with 50 elements ?
- a) 50
 - b) 49
 - c) 0
 - d) 1
- ix) Union item `{char name; int code; float price;} u;`
- How much space is occupied by this union ?
- a) 1 byte
 - b) 2 bytes
 - c) 4 bytes
 - d) 7 bytes
- x) Conditional operator is a operator.
- a) unary
 - b) binary
 - c) ternary
 - d) quaternary

GROUP - B

(Short Answer Type Questions)

Answer any *three* of the following. $3 \times 5 = 15$

2. What do you mean by local variable and global variable ?
Discuss various available storage classes in C. $2 + 3$
3. Write a program to print the sum of the following series.
$$S = 1 \wedge 2 + 2 \wedge 2 + 3 \wedge 2 + \dots + n \wedge 2.$$
4. Write down the difference between structure and union.
Write a function to print the sum of the even numbers from 1 to n. $2 + 3$
5. Discuss call by value and call by reference with example.
6. What is header file in C ? What are the differences between inbuilt and user defined function ? What is pre-processor directive ? $1 + 3 + 1$

GROUP - C

(Long Answer Type Questions)

Answer any *three* of the following. $3 \times 15 = 45$

7. a) What are the basic differences between while, do while and for loop ?
- b) Write a C program to print natural numbers from 1 to n.
- c) Write a C program to find factorial of a given integer.

$5 + 5 + 5$

8. a) Write a C program to print integers from 1 to n omitting those integers which are divisible by 10.
- b) Write a C program to find the square of the sum of the digits of any given positive integer. $7 + 8$
9. a) Is printf a function ? If yes, then what does it return ?
- b) Determine how much money is in a piggy bank that contains several 50, 25, 20, 10 and 5 paise coins. Use the following values to test the program : five 50 paise, three 25 paise, two 20 paise, one 10 paise and fifteen 5 paise.
- c) Write a C program to find out the biggest among three numbers using one extra variable. $4 + 6 + 5$
10. a) What are the basic advantages of using recursive function ?
- b) Write a C program to display the Fibonacci Series of n numbers using recursion.
- c) Write a C program to check whether a number is prime or not. $5 + 5 + 5$
11. a) Write a program to print the series as given alongwith the sum :
 $1 - 2 + 3 - 4 + 5 - \dots n.$
- b) Write a program to find the LCM of two numbers. $8 + 7$
-

BCA-103

INTRODUCTION TO PROGRAMMING

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Full Marks: 70

The questions are of equal value.

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GROUP A

(Multiple Choice Type Questions)

1. Answer all questions.

10×1 = 10

(i) What is the range of "real constants" in 'C'?

(A) -3.8×10^{38} to 3.8×10^{38}

(B) $-34E37$ to $34E37$

(C) -6.4×10^{34} to 6.4×10^{34}

(D) $-68E33$ to $68E33$

(ii) What will be the output of the following statement?

```
/**printf("hello");**/
```

(A) hello

(B) no output

(C) error

(D) "hello"

(iii) What will be the output of the following statement?

```
printf("%i", 35, 2 + 8 * 5 % 10 - 2);
```

(A) error

(B) 0

(C) 35

(D) 350

(iv) What will be the output of the following statements?

```
int a= printf("00");printf("%d",a);
```

(A) 0

(B) 00

(C) 002

(D) garbage value

(v) What will be the output of the following statement?

```
int a = 4, b = 7, c; c = a == b; printf("%i",c);
```

- (A) 0
- (B) error
- (C) 1
- (D) garbage value

(vi) What will be the output of the following program?

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

```
int a = 10;
```

```
void main()
```

```
{ int a = 50; printf("%d",a);}
```

- (A) 50
- (B) error
- (C) 10
- (D) garbage value

(vii) In which header file is the NULL macro defined?

- (A) stdio.h
- (B) stddef.h
- (C) stdio.h and stddef.h
- (D) math.h

(viii) The tool used to convert a "C" program to machine language is called as

- (A) linker
- (B) language translator
- (C) compiler
- (D) preprocessor

(ix) C programming language is a/an

- (A) object oriented programming language
- (B) procedure oriented programming language
- (C) function oriented programming language
- (D) none of these

(x) Which of the following is a keyword

- (A) main()
- (B) signed
- (C) integer
- (D) floating

GROUP B
(Short Answer Type Questions)

Answer any *three* questions.

3×5 = 15

2. Explain the difference between 'call by reference' and 'call by value' with example.
3. What do you mean by recursion? Write a recursive function called power () to calculate x rise to the power n.
4. Compare array and linked list.
5. Write a program to print the sum of the following series of n terms:
S= 1 + (1+2) + (1+2+3) +.....
6. Use a structure to define complex numbers and write a program in "C" to add two complex numbers.

2+3

GROUP C
(Long Answer Type Questions)

Answer any *three* questions.

3×15 = 45

7. Briefly describe the different loop control structures in 'C' with syntax, example and explanation. What is the difference between local variable and global variable. Write a recursive function for "P_r" calculation.
8. Explain with examples the meaning of explicit and implicit type casting. Write a note on logical operators available in C. Write a program to check the number is prime or not.
9. What do you mean by storage classes in 'C'? Name different storage classes and explain each with examples. Write a 'C' program that implements the matrix transpose using 2-D array.
10. What is union? What is switch case. Explain with example. Describe different types of data types. Write a 'C' program to print the Fibonacci sequence of n numbers.

5+3+7

5+5+5

3+4+8

2+2+5+6

11. Write short notes on any *three* of the following:

3×5

- (a) `getc()` and `getchar()` function.
- (b) `Go` and `continue`.
- (c) `Auto` and `extern`.
- (d) Actual and formal arguments.

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**MAULANA ABUL KALAM AZAD UNIVERSITY OF TECHNOLOGY,
WEST BENGAL**

BCA-103

INTRODUCTION TO PROGRAMMING

Time Allotted: 3 Hours

Full Marks: 70

*The questions are of equal value.
The figures in the margin indicate full marks.
Candidates are required to give their answers in their own words as far as practicable.
All symbols are of usual significance.*

**GROUP A
(Multiple Choice Type Questions)**

1. Answer any *ten* questions. 10×1 = 10

(i) The default return type of any C function is

- | | |
|-----------------------|---------------------|
| (A) a character value | (B) a decimal value |
| (C) an integer value | (D) void |

(ii) How many times will the loop be executed?

```
for(m = 1; m <= 10; m++)  
{  
    printf("\n India");  
    m += 3;  
}
```

- | | |
|--------|----------|
| (A) 10 | (B) 4 |
| (C) 3 | (D) none |

(iii) Which operator is not a binary operator?

- (A) + (B) ++
(C) * (D) none of these

(iv) Data type of the controlling statement of a SWITCH statement cannot be of the type

- (A) int (B) char (C) short (D) float

(v) The size of a character variable in 'C' is

- (A) 1 byte (B) 2 bytes (C) 4 bytes (D) 8 bytes

(vi) How long the following loop runs?

for (w = 0; w = 3; w++)

- (A) forever (B) three times
(C) four times (D) never

(vii) Print the output of the following

```
void main()
{
    int a = -3;
    a = -a - a + !a;
    printf("%d\n", a);
}
```

- (A) -3 (B) -6 (C) 6 (D) error

(viii) Which is the symbol for NULL?

- (A) '\t' (B) '\0' (C) '\n' (D) none

(ix) Find the output

```
int main()
{
    int a = 9;      char ch = 'A';
    a = a + ch + 24;
    printf("\t%d \t%d \t%c", ch, a, a);
    return 0;
}
```

- (A) 65 98 b (B) 66 65 a
(C) error (D) none

(x) `sizeof` () is a

- | | |
|----------------|--------------|
| (A) function | (B) operator |
| (C) identifier | (D) none |

(xi) `?:` is _____

- | | |
|--------------------------|-------------|
| (A) conditional operator | (B) keyword |
| (C) both (A) and (B) | (D) none |

(xii) Which of the following operators represent logical OR?

- | | |
|---------------------|---------------------|
| (A) Or | (B) <code>!=</code> |
| (C) <code> </code> | (D) <code>~</code> |

GROUP B
(Short Answer Type Questions)

Answer any *three* questions.

3×5 = 15

- | | | |
|----|--|-----|
| 2. | Write a C program which will accept an integer number and print it removing the even digits, e.g., Input – 54327>Output – 537; Input-52863> output 53. | 5 |
| 3. | (a) Define infinite loop with an example.
(b) Explain entry control and exit control loops with example. | 2+3 |
| 4. | Write the executable part of a C program to print
1 3 5 7 9
3 5 7 9 1
5 7 9 1 3
7 9 1 3 5
9 1 3 5 7 | 5 |
| 5. | Write a program which will reverse the values in a 1D array of size N. | 5 |

6. What is NAN? When it will generate? Discuss with example. 2+3

GROUP C
(Long Answer Type Questions)

Answer any *three* questions.

3×15 = 45

7. (a) What is a Function? Give example. 4+4+7
(b) What is recursion? Write the difference between recursion and iteration.
(c) Write a program to print the first 100 Fibonacci number using recursive function.
8. (a) What is string in C? Explain working principle of any four string function. (2+4)+4+5
(b) What do you mean by calloc() and malloc()? Explain their differences.
(c) Write a program to print the following pattern
1
1 0
1 0 1
1 0 1 0
9. Write a C program to calculate $\sin(x)$ from 15
$$\sin(x) = x - \frac{x^3}{3!} + \frac{x^5}{5!} - \frac{x^7}{7!} + \dots$$

With an accuracy of 10^{-5} .
10. Write a C program to find the prime factors of a number. 15
11. Write a C program to convert Arabic numbers upto 999 to Roman, for 15
example, 26 becomes XXVI, 41 becomes XLI. Take
I = 1, V = 5, X = 10, L = 50, C = 100 and D = 500.



**MAULANA ABUL KALAM AZAD UNIVERSITY OF
TECHNOLOGY, WEST BENGAL**

Paper Code : BCA-103

INTRODUCTION TO PROGRAMMING

Time Allotted : 3 Hours

Full Marks : 70

The figures in the margin indicate full marks.

*Candidates are required to give their answers in their own
words as far as practicable.*

GROUP – A

(Multiple Choice Type Questions)

1. Choose the correct alternatives for the following :

10 × 1 = 10

i) In C, sizeof is

- a) an operator
- b) a function
- c) a macro
- d) none of these.

ii) Which of the following is not a logical operator ?

- | | |
|------|--------|
| a) & | b) & & |
| c) | d) ! |

iii) The keyword used to transfer control from a function back to the calling function is

- a) switch b) goto
- c) exit d) return.

iv) How many times will the loop be executed ?

```
for ( i = 1 ; i <= 10 ; i ++ )  
{  
    printf ( "\Hello" ) ;  
    i + = 3 ;  
}
```

- a) 10 b) 4
- c) 3 d) none of these.

v) When both global and local variables have the same name

- a) local variable will be accessed
- b) global variable will be accessed
- c) compilation error will occur
- d) none of these.

vi) Array passed as an argument to a function is interpreted as

- a) maximum number of elements that the array can hold
- b) value of the first element of the array
- c) address of the first element of the array
- d) none of these.

vii) What will be the output for the following program ?

```
main()  
{  
    int i;  
    for ( i = 0 ; i < 4 ; ++ i ) ;  
    printf ( "%d", i ) ;  
}
```

- a) Compilation error b) 1 2 3 4
c) 0 1 2 3 d) 4.

viii) How many times will be the loop be executed ?

```
x = 500 ;  
while ( x < = 500 )  
{  
    x = x - 600 ;  
    if ( x < 0 )  
        break ;  
}
```

- a) 0 b) 1
c) 500 d) 100.

ix) Which of the following operators accepts only integer operand ?

- a) + b) *
c) / d) %

- x) What should be the correct output of the following program ?

```
main()  
{  
    int k, num = 30 ;  
    k = (num > 5 ? (num < 10 ? 100 : 200) : 500) ;  
    printf ("%d %d", num, k) ;  
}
```

- a) 200 30 b) 30 100
c) 30 200 d) 30 500.

GROUP - B

(Short Answer Type Questions)

Answer any *three* of the following. $3 \times 5 = 15$

2. Explain the storage classes available in C. What do you mean by scope of the variable ? 4 + 1
3. Define loop. Explain different types of loops available in C with suitable examples. 1 + 4
4. What do you mean by call by value & call by reference ?
Explain with examples.

5. In an organization, 55% of Basic Salary is given as DA while HRA is 15% of Basic Salary. PF is deducted at the rate of 12.5% of Gross Salary. Write a C program to calculate Net Salary. [Gross Salary = Basic + DA + HRA and Net Salary = Gross Salary - PF]
6. Write C code to print following figure for n no. of lines :

```

          1
        2 3
      4 5 6
    7 8 9 10
  11 12 13 14 15
  .....
```

GROUP - C

(Long Answer Type Questions)

Answer any *three* of the following. $3 \times 15 = 45$

7. a) Define array. Explain different types of array in detail.
- b) State and explain various types of standard function with example.
- c) State and explain different phases used in user defined function.

$5 + 5 + 5$

8. a) Explain function with return and function with arguments with example.
- b) State and explain different types of string functions with example.
- c) Write a program to check a number is palindrome or not. 5 + 5 + 5

9. a) Explain the following using general syntax and example :

- i) if
- ii) if-else
- iii) nested if-else.

- b) Write a C language program to compute following series :

$$G = 1 + x^3/3! + x^5/5! + x^7/7! + \dots \text{ up to } n \text{ terms.}$$

8 + 7

10. a) Explain the following :

- i) while
- ii) do-while
- iii) for.

- b) Write the pattern program given below :

```
      *           *
    * *         * *
  * * *       * * *
* * * * *   * * * * *
```

8 + 7

11. a) What is function ?
- b) What do you mean by the following ?
- i) Function declaration
 - ii) Function calling
 - iii) Function definition.
- c) When is it necessary to declare prototype of a function ?
- d) Write a program to arrange a group of numbers into positive and negative numbers. $2 + 3 + 3 + 7$
-



**MAULANA ABUL KALAM AZAD UNIVERSITY OF
TECHNOLOGY, WEST BENGAL**

Paper Code : BCAN-103

C PROGRAMMING

Time Allotted: 3 Hours

Full Marks: 70

The figures in the margin indicate full marks.

*Candidates are required to give their answers in their own words
as far as practicable.*

Group – A

(Multiple Choice Type Questions)

1. Choose the correct alternative for *any ten* of the following: 1×10=10
- (i) Identify the erroneous expression:
- | | |
|-------------------------------|-------------------------------------|
| (a) <code>a = b = 2,4;</code> | (b) <code>num = ++a * 5;</code> |
| (c) <code>num *= 4;</code> | (d) <code>num = a++ - b * 2;</code> |
- (ii) The default return type of any C function is
- | | |
|-----------------------|---------------------|
| (a) a character value | (b) a decimal value |
| (c) an integer value | (d) void |
- (iii) Which statement is used to terminate the execution of the nearest enclosing loop in which it appears?
- | | |
|-------------|--------------|
| (a) Break | (b) Continue |
| (c) Default | (d) Case |
- (iv) "Interest rate is decreased by 2%". Select the statement below, which will display the same:
- | |
|--|
| (a) <code>printf("Interest rate is decreased by 2\\%");</code> |
| (b) <code>printf("Interest rate is decreased by 2'%");</code> |
| (c) <code>printf("Interest rate is decreased by 2%%");</code> |
| (d) <code>printf("Interest rate is decreased by 2%");</code> |

- (v) Given an integer array, arr[], the i^{th} element can be accessed by writing
- (a) (arr + i)
 - (b) *(i + arr)
 - (c) arr[i]
 - (d) All of these
- (vi) The operator * operating in unary mode signifies a
- (a) Referencing operator
 - (b) Dereferencing operator
 - (c) Address operator
 - (d) None of these
- (vii) A structure member variable is generally accessed using the
- (a) address operator
 - (b) dot operator
 - (c) comma operator
 - (d) None of these
- (viii) The variable retains its value in-between function calls is _____.
- (a) auto
 - (b) static
 - (c) register
 - (d) extern
- (ix) void main() {
 int a=0,b=1,c=2,x;
 x=a++||b++||c++;
 printf("%d%d%d",x,a,b,c);
(a) 1 1 2 3
(b) 1 0 1 2
(c) 1 1 1 2
(d) None of these
- (x) Find the output:
int main()
{ int a=9; char ch='A';
 a = a + ch + 24;
 printf("\t%d \t%d \t%c",ch,a,a);
 return 0;
}
(a) 65 98 b
(b) 66 65 a
(c) error
(d) None of these
- (xi) The preprocessor directives must be preceded by which symbol?
- (a) *
 - (b) &
 - (c) @
 - (d) #

Group – B

(Short Answer Type Questions)

Answer any three of the following.

5×3=15

2. What is the difference between break and continue? What is ternary operator? What is a keyword? 2+2+1=5
3. Draw a flowchart to check whether a user given number is palindrome or not. 5
4. Write a C program to add the following series:
 $1 + 2/2! + 3/3! + 4/4! + \dots + n/n!$, where value of n is given by user. 5
5. What do you mean by scope of a variable? Explain the different storage classes available in C. 1+4=5
6. Write a C program to convert a binary number to its equivalent decimal number. 5

Group – C

(Long Answer Type Questions)

Answer any three of the following.

15×3=45

7. (a) Explain the difference between “call by value” and “call by reference” with example.
 (b) What are the advantages of using functions in C programming? What is the difference between user-defined functions & library functions?
 (c) What is the difference between recursion and iteration?
 (d) Write a program to check whether the number given by the user is a Krishna Murthy number or not.
 Krishna Murthy Number: It is a number which is equal to the sum of the factorials of all its digits.
 For example: $145 = 1! + 4! + 5! = 1 + 24 + 120 = 145$ $4+(2+1)+2+6=15$
8. (a) Differentiate between while loop and do-while loop.
 (b) What is switch-case? What are the advantages of switch-case?
 (c) Differentiate between `getc()` and `getchar()` function.
 (d) Write a C program to print the sum of the following series of n terms:
 $1 + (1+2) + (1+2+3) + \dots$ $3+(2+2)+3+5=15$
9. (a) What is string in C? Explain with example.
 (b) Write a C program to reverse a string given as user input.
 (c) What are local variable and global variable?
 (d) What is a pointer?
 (e) Write a recursive function for GCD calculation. $2+5+2+1+5=15$

10. Define Structure and Union. How does union differ from structure? How can you access the member of these types? Discuss with an example. Write a function that will scan a character string passed as an argument and convert all lowercase characters into their uppercase equivalents. 3+3+3+6=15

11. Write short notes on *any three* of the following: 5×3=15

- (a) malloc() and calloc()
 - (b) Actual and Formal arguments
 - (c) strcpy(), strcat(), strcmp() and strcmp() functions
 - (d) Function declaration, function definition, function calling
 - (e) Macro in C language
-