

FEB 2023 EXAMINATION
I B.Tech. (4YDC) EXAMINATION
CO10504/ CO10507: PROGRAMMING FOR PRBLEM SOLVING

Time: 3 Hrs.]

[Max. Marks: 70

TOTAL NO. OF QUESTIONS IN THIS PAPER: 5

NOTE: 1) Answer to the point and make assumptions wherever required and clearly state them.
 2) Attempt all parts of same question at one place and each question carries five sub parts a, b, c, d, e. Part a, b, c is compulsory and attempt any one from d and e.

Question No.	Question	Marks	CO	BT	PI
Q.1 (a)	Differentiate between: i) Source code file and executable code file ii) Keywords and Identifiers	02	CO1	BT1	1.7.1
(b)	Identify the most appropriate answer of the following : i) _____ command is used to rename a file in linux environment. ii) Computers use the _____ language to process data. iii) Scanner and Mouse are examples of _____ types of devices. iv) Internet Explorer is an example of _____ software. (System/Application)	02	CO1	BT1	1.7.1
(c)	Answer the following: (i) How many bits are there in the following - byte, megabyte, and gigabyte? (ii) Enlist the name of Linux commands that are used for development of the program using C language.	03	CO1	BT2	1.7.1
(d) (i)	Draw a flowchart to check whether the given integer number is a prime number or not. In flowchart handle all cases of the number i.e. negative number, positive number and non-integer.	05	CO1	BT3	2.5.2
(ii)	How run-time error is different from compile-time errors?	02	CO1	BT2	1.7.1
OR					
(e) (i)	Draw a flowchart to calculate the sum of series. $\text{Sin}(x) = x - x^3/3! + x^5/5! - x^7/7! + \dots$	05	CO1	BT3	2.5.2
(ii)	What is a variable? Explain the ways to declare scope of a variable.	02	CO1	BT2	1.7.1
Q.2 (a)	Differentiate between type casting and type conversion with the help of an example.	02	CO2	BT2	1.7.1
(b)	Identify the most appropriate answer of the following: i) _____ is the range of values that can be stored by int datatype in C. ii) ?: is a type of _____ operator. iii) _____ is the number of whitespace characters allowed in C language. iv) _____ case is matched in a switch statement, when all cases are unmatched.	02	CO2	BT2	1.7.1
(c)	Write a program that prints a table with each line giving an integer, its square, and its cube. Ask the user to input the lower and upper limits for the table.	03	CO2	BT2	1.7.1
(d)	Evaluate the expressions for the following, assume that the variables are declared and initialized as follows: int x = 3, y = 4, z = 5; float a = 2.5, b = 3.5, c = 4.5; i) (float)b * (y % x) * y / 2 z * x ; ii) ++x / 4 * z++ + y / x++ * b; iii) y < c x > a * ++x && z <= 5 * b ;	07	CO2	BT3	1.2.1
OR					
(e)	Write a program to find the difference of two dates in years, month, and days. Find whether the entered dates are valid or not. Assume that the first date falls before second date.	07	CO2	BT3	2.5.2
Q.3 (a)	What is an infinite loop? Write the syntax of infinite loop using for loop.	02	CO3	BT2	1.7.1

- (b) Explain the output of the following C code with proper justification? 02 CO3 BT4 2.5.2
- ```
#include <stdio.h>
int main(){
 int i, j;
 for (i = 2; i < 10; i++) {
 for (j = 2; j <= 5; j++)
 if (!(i % j))
 break;
 if (j > (i / j))
 printf("%d ", i); }
 return 0; }
```

- (c) Write the following function in a recursive manner. 03 CO3 BT4 3.8.2
- ```
int function(int n)
{
    int sum=0;
    int count=1;
    while(count <=n) {
        sum = sum+ count;
        count+count+2; }
    return sum; }
```

- (d) Two different numbers are called amicable numbers, if the sum of the proper divisors of each is equal to the other number. For example 220 and 284 are amicable numbers.
Sum of proper divisors of 220 = 1+2+4+5+10+11+20+22+44+55+110 = 284
Sum of proper divisors of 284 = 1+2+4+71+142 = 220
Write a function to print all amicable numbers in a given range.

OR

- (e) Consider a sorted array X of n elements. Given a key to be searched, the array is partitioned into three halves at the elements mid1 and mid2. mid 1 indicates 1/3rd index and mid2 indicates 2/3rd index of the sorted array. Now comparing the key value to mid1 or mid2 is it determined whether the key lies in first third, middle third or last third of the array. Continue the process until the key is found, if it exists in the array. Write a recursive function TernarySearch(), which takes 4 arguments as input: array, left index, right index, key to be searched. The program should return the value of the key and index, if it exists in the array, otherwise returns -1. 07 CO3 BT3 3.8.2

- Q.4 (a) Explain the output of the following C code with proper justification? 02 CO4 BT4 2.5.2
- ```
#include <stdio.h>
int main(){
 int arr[5]= {1, 2, 3, 4, 5};
 int *ptr1= arr;
 int *ptr2= ptr1+3;
 int *ptr3= ptr2+3;
 printf("%d\n", *ptr2);
 printf("%ld\n", ptr2-ptr1);
 printf("%d\n", *(arr+4));
 return 0; }
```

- (b) Differentiate between call by value and call by reference with the help of an example. 02 CO4 BT2 1.7.1
- (c) Write a program using function reverse (), that takes a string as argument and reverses only a portion of the string using pointers. 03 CO4 BT3 4.5.1
- (d) Consider a 1-D array of integers 0's and 1's. Write a program which reads the 0/1 array having n (<20) elements and then prints the length of the longest sequence of 1's.  
Example , if the input array is int arr[15]= {0,1,0,1,1,0,0,1,1,1,1,0,1,0,1} the length of the longest run of 1's is 4. 07 CO4 BT3 4.5.1

OR

- (e) A record of "n" employee using an array of structures with four fields (empId, ename, age, salary) is maintained. Each field is of an appropriate data type. Write a program to store records of this structure in a file and sort them on the basis 07 CO4 BT3 4.5.1

of empId and name.

- Q.5 (a) Compare and contrast the structured programming and object oriented programming. 02 CO4 BT2 1.7.1
- (b) Explain the visibility of base class members for the access specifiers: private, protected, and public. 02 CO4 BT2 1.7.1
- (c) Differentiate between the following: 03 CO4 BT2 1.7.1  
(i) Function overloading and Operator overloading  
(ii) Abstraction and Encapsulation
- (d) Create a class named Shape with a function that prints "This is a shape". Create another class named Polygon inheriting the Shape class with the same function that prints "Polygon is a shape". Create two other classes named Rectangle and Triangle having the same function which prints "Rectangle is a polygon" and "Triangle is a polygon" respectively. 07 CO4 BT3 4.5.1

OR

- (e) Implement a class 'printdata' with two-member functions all with the same name 'print' 07 CO4 BT3 4.5.1  
**void print(int)** – outputs value – , that is, value followed by the value of the integer  
**void print (int, int)** – outputs value – [, ], that is, value followed by the two integers separated by a comma in square brackets.  
Write a main function that uses the above class and its member functions.

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**Online Feb. 2022 EXAMINATION**  
**I B.E./ B.Tech (4YDC) EXAMINATION**  
**CO 10504: COMPUTER PROGRAMMING**

Time: 90 Mins.]

[Max. Marks: 40

TOTAL NO. OF QUESTIONS IN THIS PAPER: 5

**NOTE:**

- 1) Answer to the point and make assumptions wherever required and clearly state them.  
 2) Attempt all parts of same question at one place and each question carries two sub parts a and b.  
 Attempt any one from a and b.

| Question No. | Question                                                                                                                                                                                                                                                                                                                                                                                                 | Marks | CO       | BL  |
|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|----------|-----|
| Q.1 (a) (i)  | Solve the following:<br>i) $(1834.342)_{11} = (?)_9$<br>ii) $(C3F.C4B)_{17} = (?)_5$<br>iii) $(647.123)_8 = (?)_2$                                                                                                                                                                                                                                                                                       | 04    | CO1      | BL2 |
|              | (ii) Draw a flowchart to print the sum of squares of all even numbers between 2 to 500 (both numbers inclusive).                                                                                                                                                                                                                                                                                         | 04    | CO1      | BL2 |
|              | <b>OR</b>                                                                                                                                                                                                                                                                                                                                                                                                |       |          |     |
| (b) (i)      | Solve the following:<br>i) $(686.3A2)_{16} = (?)_8$<br>ii) $(324.3124)_{11} = (?)_7$<br>iii) $(231.212)_5 = (?)_9$                                                                                                                                                                                                                                                                                       | 04    | CO1      | BL3 |
|              | (ii) Draw a flowchart to find if the given number is a palindromic prime number or not.                                                                                                                                                                                                                                                                                                                  | 04    | CO1      | BL2 |
| Q.2 (a) (i)  | Solve the following for the values int a = 10, b= -15, c =20,d= -6, Z=0;<br>1) $Z = a < b \parallel ++c * 2 \% 2 + 1 \&\& 2 + !b \% 2$ ;<br>2) $Z = ++b * d > a \% b * -1? a \% 2 - 20 : c * 10 + 5$ ;<br>3) $Z = a + 5 * c * d < a \&\& b$                                                                                                                                                              | 04    | CO1      | BL5 |
|              | (ii) An astrologist map large numbers to single digit number between 1 and 9 in order to tell your future. Suppose Ram went to an astrologist to find his future. Suppose he tell his date of birth as 19011987 and astrologist maps it to 9. Write a program, which takes a number as input and it reduces it to a single digit.                                                                        | 04    | CO2      | BL3 |
|              | <b>OR</b>                                                                                                                                                                                                                                                                                                                                                                                                |       |          |     |
| (b) (i)      | Write a program using switch to take a 4-digit integer as input and check if it is divisible by 2, 3, 4, and 12.                                                                                                                                                                                                                                                                                         | 04    | CO2, CO3 | BL4 |
|              | (ii) You are given a sequence of non-negative integers terminated by -1. You have to output 1 if there are atleast 2 distinct elements in the sequence and 0 if the sequence consists of only 1 integer. Note that -1 is not part of the sequence. The sequence is not necessarily sorted. Note: Don't use arrays to this question.<br>Example: Input: 1 1 1 2 -1 Output: 1, Input: 4 4 4 4 -1 Output: 0 | 04    | CO3      | BL4 |



|           |     |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |    |     |     |
|-----------|-----|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|-----|-----|
| Q.3       | (a) | (i)  | Write a program to input two 1-D int type arrays A[10] and B[10] which contain positive integers and store the set difference A-B in C. Fill the remaining positions of C[10] with -<br>1. Assume that all the elements in A and B are distinct.<br>For Example: Set difference A-B is the subset of A which have elements which are not in B.<br>A={1,2,6,11,3}, B={2,7,9,10,11} then A-B={1,6,3}.                                                                           | 04 | CO3 | BL4 |
|           |     | (ii) | Write a program that takes two positive integers n1 and n2 from the user and check if they are permutation of each other.                                                                                                                                                                                                                                                                                                                                                     | 04 | CO4 | BL5 |
| <b>OR</b> |     |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |    |     |     |
|           | (b) | (i)  | The following program intends to compute $\pi$ by Newton's formula upto the 10000-th term:<br>$\frac{\pi}{2} = \sum_{k=0}^{\infty} \frac{2^k (k!)^2}{(2k+1)!}$<br>Fill up the dashed lines in the program<br>#include <stdio.h><br>int main ()<br>{<br>double sum = _____;<br>double term = _____;<br>int k = _____;<br>for(; k < 10000; ++k) {<br>term = _____;<br>sum = _____;<br>}<br>sum = _____;<br>printf("%lf", sum);<br>return 0;<br>}                                | 04 | CO4 | BL4 |
|           |     | (ii) | Write a recursive function for finding length of strings and display the string the string in front and reverse order.                                                                                                                                                                                                                                                                                                                                                        | 04 | CO3 | BL5 |
| Q.4       | (a) | (i)  | Write a Program using pointers to find whether the two strings are anagram or not. For Example: LISTEN and SILENT are two anagram strings.                                                                                                                                                                                                                                                                                                                                    | 04 | CO3 | BL4 |
|           |     | (ii) | Given the current time and time required for a class, it is desired to find out the time when the class ends. Write a structure to represent time in hour, minutes, and seconds. Also write a function which gets the current time and class time, and returns the end time of class.                                                                                                                                                                                         | 04 | CO3 | BL5 |
| <b>OR</b> |     |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |    |     |     |
|           | (b) | (i)  | The absolute distance between two integers x1 and x2 is given by  x2-x2 . Write a function which sorts an array x[ ] of n integers in ascending order of their absolute distances with a given number z. For example, given x[ ]= {9, 1, 12, 4, 2} and z=6, the sorted array will be x[ ]= {4, 9, 2, 1, 12}. Note that 4 is closest to 6, and 12 is farthest from 6 in terms of absolute distance. The function Prototype will be:<br>void sort_abs (int x[ ], int n, int z); | 04 | CO4 | BL4 |

|     |     |                                                                                                                                                                                                                                                 |    |     |             |
|-----|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|-----|-------------|
|     |     | (ii) Write a program which uses a structure that read roll number, name, and percentage of 5 students. If the percentage of the student is greater than 70 then write its information to the file 'F1.txt' otherwise write it to file 'F2.txt'. | 04 | CO4 | BL5         |
|     |     |                                                                                                                                                                                                                                                 |    |     |             |
| Q.5 | (a) | (i) Enlist the major differences between procedures oriented and object oriented programming languages.                                                                                                                                         | 04 | CO4 | BL4         |
|     |     | (ii) Differentiate between the following with programming example:<br>i) Function overloading and Operator overloading<br>ii) Object and Class<br>iii) Abstraction and Encapsulation                                                            | 04 | CO4 | BL2,<br>BL3 |
|     |     | <b>OR</b>                                                                                                                                                                                                                                       |    |     |             |
|     | (b) | (i) Differentiate between the following with programming example:<br>i) Overloading and overriding<br>ii) Multiple Inheritance and multilevel inheritance<br>iii) Static binding and dynamic binding                                            | 04 | CO4 | BL2,<br>BL3 |
|     |     | (ii) Enlist the major advantages of C++ programming language. Justify your answer using a programming example.                                                                                                                                  | 04 | CO4 | BL4         |
|     |     | xxxxx                                                                                                                                                                                                                                           |    |     |             |





JUNE-JULY 2022 EXAMINATION  
I B.Tech. (4YDC) EXAMINATION  
CO 10504: COMPUTER PROGRAMMING

Time: 3 Hrs.]

[Max. Marks :70  
[Min Marks :22

TOTAL NO. OF QUESTIONS IN THIS PAPER: 5

NOTE: 1) Answer to the point and make assumptions wherever required and clearly state them. Assume C programming language wherever required. 2) Attempt all parts of same question at one place and each question carries five sub parts a, b, c, d, e. Part a, b, c is compulsory and attempt any one from d and e.

- |                                                                                                                                                                                                                                                                     | Marks | CO  | BT  | PI    |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-----|-----|-------|
| Q.1 (a) Explain how negative numbers are represented in the computer memory? Give one example.                                                                                                                                                                      | 02    | CO1 | BT2 | 1.2.1 |
| (b) Identify the most appropriate answer of the following :<br>i) _____ are the memory of the CPU.<br>ii) 2MB is equivalent to _____ bits.<br>iii) _____ command is used delete the file in Linux operating system.<br>iv) 'gedit' is an example of _____ software. | 02    | CO1 | BT1 | 1.7.1 |
| (c) Draw a flowchart to take four points from user (x1,y1), (x2,y2), (x3,y3) and (x4,y4) and find out if these points form an parallelogram or not.                                                                                                                 | 03    | CO1 | BT3 | 2.5.2 |
| (d) Differentiate between the following with the help of an example:<br>i) Source code file and executable file<br>ii) Unary operators and ternary operator<br>iii) short int and long int<br>iv) Type conversion and type casting                                  | 07    | CO1 | BT2 | 1.7.1 |

OR

- |                                                                                             |    |     |     |       |
|---------------------------------------------------------------------------------------------|----|-----|-----|-------|
| (e) Solve the following :<br>i) $(A245.219)_{13} = (?)_6$<br>ii) $(1B123.CA2)_{16} = (?)_5$ | 07 | CO1 | BT3 | 1.2.1 |
| ii) $(F3.1532)_{17} = (?)_8$<br>iv) $(1341.567)_9 = (?)_{16}$                               |    |     |     |       |

- |                                                                                                                                                                                                                                                                                                                                                                                |    |     |     |       |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|-----|-----|-------|
| Q.2 (a) What is the difference between constant using #define macro and const keyword?                                                                                                                                                                                                                                                                                         | 02 | CO1 | BT2 | 1.7.1 |
| (b) Discuss about iterative statements? What are the different types of iterative statements in C?                                                                                                                                                                                                                                                                             | 02 | CO2 | BT2 | 1.7.1 |
| (c) What is an identifier (variable)? What are the rules to construct identifier (variable)? Classify the following as valid/invalid Identifiers.<br>i) num2 ii) \$num1 iii) +add iv) a_2 v) 199_space vi) _apple                                                                                                                                                              | 03 | CO2 | BT2 | 1.7.1 |
| (d) Evaluate the expressions for the following, assume that the variables are declared and initialized as follows:<br>int x = 1, y = 2, z = 3;<br>float a = 1.1, b = 2.2, c = 3.3;<br>i) $a * z \% y * (\text{int})c / 5 \&\& y > x \parallel y++;$<br>ii) $++x / 2 / y++ * z / x++ * a \&\& z;$<br>iii) $(x <= z) \parallel ( ++y > b * ++x ) \&\& (z >= 5 * \text{int}(c));$ | 07 | CO2 | BT5 | 1.2.1 |

OR

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|----------------------------------------------------------------------------------------------------------------------------------------------------|----|-----|-----|-------|
| (e) Write a program which reads an integer $n > 10$ and a real variable $x, 0 <=  x  <= 1$ . Compute and print the sum of the series upto n terms: | 07 | CO3 | BT4 | 2.6.3 |
|----------------------------------------------------------------------------------------------------------------------------------------------------|----|-----|-----|-------|

$$\sin^{-1}(x) = x + \frac{1}{2} \cdot \frac{x^3}{3} + \frac{1}{2} \cdot \frac{3}{4} \cdot \frac{x^5}{5} + \dots + \frac{1}{2} \cdot \frac{3}{4} \cdot \frac{5}{6} \cdot X \dots X \frac{2i-3}{2i-2} \cdot \frac{x^{2i-1}}{2i-1} + \dots$$

The program should NOT use any standard library function.

- |                                                                                                                                                                                                                                             |    |     |     |       |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|-----|-----|-------|
| Q.3 (a) Differentiate between printf( ), fprintf( ), puts( ), and fputs( ).                                                                                                                                                                 | 02 | CO3 | BT2 | 2.6.4 |
| (b) Tabulate the scope and life time of the following :<br>(i) External variable (ii) Static variable (iii) Automatic variable (iv) Register variable                                                                                       | 02 | CO3 | BT1 | 1.7.1 |
| (c) Write a C function isprime(num) that accepts an integer argument and returns 1 if the argument is a prime or 0 otherwise. Write a program that invokes this function to generate prime numbers between the given ranges.                | 03 | CO3 | BT4 | 4.6.3 |
| (d) Write a recursive program to calculate the value of nCr. nCr is the number of ways of selecting r items given n items. The recurrence for calculating nCr is given by:<br>$nCr = {}^{n-1}C_r + {}^{n-1}C_{r-1}$ . Assume that $n > r$ . | 07 | CO3 | BT4 | 4.5.1 |

OR

- |                                                                                                   |    |     |     |       |
|---------------------------------------------------------------------------------------------------|----|-----|-----|-------|
| (e) Consider the Peasants' Algorithm for multiplication of two positive integers. It works in the | 07 | CO4 | BT4 | 4.6.3 |
|---------------------------------------------------------------------------------------------------|----|-----|-----|-------|

1/2



following manner.

- i. Write the two numbers in two columns.
- ii. Keep updating according to the following procedure until the number in the first (i.e., left) column becomes 1.
- iii. Halve the number in first column (integer division), double the number in the second column.
- iv. At the end, sum up all the numbers in the second column, for which, corresponding number in the first column is odd.

Example of multiplication using Peasants' algorithm:  $13 \times 8: 64+32+8 = 108$

|    |    |
|----|----|
| 13 | 8  |
| 6  | 16 |
| 3  | 32 |
| 1  | 64 |

Fill in appropriate blanks in function for calculating multiplication using Peasants' Algorithm.

```
void peasantMultiplication(int num_col1, int num_col2, int answer)
{
 int count=0;
 while(1){
 count++;
 if(_____)
 answer = _____ + _____ ;
 if(_____)
 _____ ;
 num_in_col1 = _____ / 2;
 num_in_col2 = _____ *2; } }
```

- Q.4 (a) Explain the following: 02 CO4 BT2 1.7.1
- i. Write a statement to read a file in append mode.
  - ii. Write the purpose of the fseek() function.
- (b) Is it possible to return multiple values from a function? Justify the statement with the help of an example. 02 CO3 BT2 2.5.2
- (c) Write a program that takes string as input from the user and replaces each alphabet in the string with next alphabet except letters "z" "Z" and "a" "A". For example-  
Input string: "Programming in Z is fun" Output String: "Qsphsainnjoh jo Z jt gvo" 03 CO4 BT3 4.4.2
- (d) Write a program to read details of 'n' number of employees from keyboard. The employee record should have three fields (id, name, salary). Print the details of employees whose salary is above 5000 and also store the information in file having name record.txt. 07 CO4 BT3 4.5.1

OR

- (e) A rectangle has two sides parallel to the x and y axis. Define a structure 'rectangle' to store coordinates of lower left and upper right vertices defined by following structure 'point'. 07 CO3, BT3 4.5.1  
CO4
- ```
typedef struct{
    float x;
    float y;
}point;
Write a function:
int inside(point p, struct rectangle r) that returns 1 if the point p is inside or on the rectangle, and 0 otherwise.
```

- Q.5 (a) Differentiate between the class and object. Explain with the help of programming example. 02 CO4 BT2 1.7.1
- (b) Explain the visibility of base class members for the access specifiers: private, protected, and public. 02 CO4 BT2 1.7.1
- (c) Explain the concept of polymorphism with the help of programming example. 03 CO4 BT2 1.7.1
- (d) Differentiate between the following: 07 CO4 BT2 1.7.1
- (i) Function overloading and Operator overloading
 - (ii) Abstraction and Encapsulation
 - (iii) Static and Dynamic binding
 - (iv) Multiple Inheritance and Multilevel Inheritance

OR

- (e) (i) Enlist the major differences between procedures oriented and object oriented programming language. 03 CO4 BT1 1.7.1
- (ii) Explain the concept of Inheritance. Demonstrate its use using programming example. 04 CO4 BT3 4.4.2

XXXXX