Programming in C and Data Structure VTU CBCS Question Paper Set 2018

CBCS Scheme

USN | | | | | | | | | | 17PCD13

First Semester B.E. Degree Examination, Dec.2017/Jan.2018
Programming in C and Data Structures

Time: 3 hrs. Max. Marks: 100

Note: Answer any FIVE full questions, choosing one full question from each module.

Module-1

1 a. List all the logical operators and write a C program to demonstrate working of these logical operators. **(10 Marks)**

b. Explain structure of C program with an example. **(05 Marks)**

c. Classify the following as valid and invalid variable. If invalid give reasons.

i) r143
ii) help+me
iii) auto
iv) hello_how
v) *a **(05 Marks)**

OR

2 a. What is a token? What are different types of tokens available in c language? Explain. **(10 Marks)**

b. Write an algorithm and program to find biggest of three numbers. **(10 Marks)**

Module-2

3 a. Write a C program to find the roots of quadratic equation. **(10 Marks)**

b. Explain syntax of while statement. Write a C program to check the given number is palindrome or not. **(10 Marks)**

OR

4 a. Explain break and continue statements with respect to do-while, while and for loop with suitable examples. **(10 Marks)**

b. Print the following series:

1
1 2
1 2 3
1 2 3 4 **(05 Marks)**

c. Explain ternary operator with suitable example. **(05 Marks)**

Module-3

5 a. Define an array. Write a syntax for declaring two dimensional array and initialize the same with suitable example. **(10 Marks)**

b. Write a C program to find sum of array elements by passing array as function argument. **(05 Marks)**

c. Explain any two string manipulation functions. **(05 Marks)**

OR

6 a. Explain recursion with an example. **(06 Marks)**

b. Write a C program to sort the elements of a given array using bubble sort. **(08 Marks)**

c. Write a C program to concatenate two strings without using built-in function strcat( ). **(06 Marks)**

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.

Module-4

7 a. What is structure? Explain its declaration and initialization with an example. **(06 Marks)**

b. Explain any four file operations with an example. **(06 Marks)**

c. Write a C program to pass structure variable as function argument. **(08 Marks)**

OR

8 a. Write a C program to store and print Name, USN, SubjectName and IA Marks of student using structure. **(10 Marks)**

b. Explain typedef with suitable example. **(05 Marks)**

c. Explain how the input is accepted from file and displayed. **(05 Marks)**

Module-5

9 a. What is pointer? Give advantages and disadvantages of pointers in C. **(07 Marks)**

b. Explain malloc( ) and calloc( ) functions with examples. **(06 Marks)**

c. What is queue? Explain its operations. **(07 Marks)**

OR

10 a. Write a C program to swap two numbers using call by address. **(08 Marks)**

b. What are primitive and non-primitive data types and explain. **(07 Marks)**

c. Define stack. List applications of stack. **(05 Marks)**

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CBCS Scheme

USN | | | | | | | | | | |

15PCD13/23

First/Second Semester B.E. Degree Examination, June/July 2016
Programming in C and Data Structures

Time: 3 hrs. Max. Marks: 80

Note: Answer any FIVE full questions, choosing one full question from each module.

Module-1

1 a. Define Pseudo code. Write a Pseudo code to find sum and average of given three numbers. **(05 Marks)**

b. What is an identifier? What are the rules to construct identifier? Classify the following as Valid/Invalid Identifiers.
i) num2 ii) $num1 iii) +add iv) a_2 **(06 Marks)**

c. Write a C program to find area of rectangle. **(05 Marks)**

OR

2 a. Explain printf and scanf functions with example. **(04 Marks)**

b. List all the operators used in C. Give examples. **(08 Marks)**

c. Write the output of the following C code

i)
```
void main ( )
 {
 int a = 5, b = 2, res1 ;
 float f1 = 5.0, f2 = 2.0, res2 ;
 res1 = 5/2.0 + a/2 + a/b ;
 res2 = f1/2 * f1 – f2 ;
 printf (“res1 = %d res2 = %f ”, res1, res2) ;
 }
```

ii)
```
void main ( )
  {
   int i  = 5, j = 6, m, n ;
   m = ++ i + j ++ ;
   n = – – i + j – – ;
   printf ( “m = %d   n = %d”, m, n) ;
  }
```

(04 Marks)

Module-2

3 a. List all the conditional control statements used in C. Write a C program to find the biggest of three numbers. **(08 Marks)**

b. Write a C program to find the reverse of an integer number NUM and check whether it is PALINDROME or NOT. **(08 Marks)**

OR

4 a. Explain the switch statement with syntax and example. **(08 Marks)**

b. List the differences between the while loop and do – while loop. Write a C program to find sum of Natural numbers from 1 to N using for loop. **(08 Marks)**

Module-3

5 a. What is an array? Explain the declaration and initialization of single and double dimensional arrays with example. **(08 Marks)**

b. Write a C program to search a name in a list of names using Binary searching technique. **(08 Marks)**

OR

6 a. Explain any Five string manipulation library functions with example. **(08 Marks)**

b. Write a C program to read N elements and find biggest element in the array. **(08 Marks)**

Module-4

7 a. What is structure? Explain the syntax of structure declaration and initialization with example. **(05 Marks)**

b. Write a C program to maintain a record of 'n' employee detail using an array of structures with three fields (id, name, salary) and print the details of employees whose salary is above 5000. **(07 Marks)**

c. Explain fprintf and fscanf functions with syntax. **(04 Marks)**

OR

8 a. Explain structure with in a structure with an example. **(07 Marks)**

b. What is a file? Explain fopen and fclose functions. **(05 Marks)**

c. Explain fgets and fputs functions. **(04 Marks)**

Module-5

9 a. What is a pointer? Explain how the pointer variable is declared and initialized. **(04 Marks)**

b. Explain any two preprocessor directives in C with example. **(06 Marks)**

c. Write a C program to swap two numbers using call by pointers (address) method. **(06 Marks)**

OR

10 a. What is dynamic memory allocation? Write and explain the different dynamic memory allocation functions in C. **(06 Marks)**

b. Explain stack and Queue data structures along with their applications. **(06 Marks)**

c. Explain how pointers and arrays are related with example. **(04 Marks)**

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15PCD13/23

First/Second Semester B.E. Degree Examination, June/July 2017
Programming in C and Data Structures

Time: 3 hrs. Max. Marks: 80

Note: Answer any FIVE full questions, choosing one full question from each module.

Module-1

1 a. Define Pseudo code. Explain with an example. **(05 Marks)**

b. Write a C program to find biggest among three numbers using ternary operator. **(05 Marks)**

c. Explain the following constants with example
   i) Integer constant
   ii) Floating constant
   iii) Character constant. **(06 Marks)**

OR

2 a. List the formatted input/output functions of C language. Explain the basic structure of C program with proper syntax and example. **(06 Marks)**

b. Define an algorithm. Write an algorithm to find the area of circle and triangle. **(06 Marks)**

c. Evaluate the following expression/code segment
   i) 22 + 3 < 6 && ! 5 || 22 = = 7&& 22 – 2 > = 5
   ii) a + 2 > b || ! c && a = = d || a – 2 < = e
   where a = 11, b = 6, c = 0, d = 7 and e = 5 **(04 Marks)**

Module-2

3 a. List all branching statements. Explain any two with proper syntax and example. **(06 Marks)**

b. Explain switch case statement with syntax and example. **(05 Marks)**

c. Write a C program to find whether given year is leap year or not. **(05 Marks)**

OR

4 a. Write the syntax of all looping control statements. Explain how break and continue statements are used in C program with example. **(06 Marks)**

b. Write a C program to find the square root of a given number without using library function. **(05 Marks)**

c. List the difference between while and do-while loop. **(05 Marks)**

Module-3

5 a. Define the array. How one and two dimensional arrays are declared and initialized? Explain. **(07 Marks)**

b. Write C program to evaluate the polynomial equation $f(x) = a_0 + a_1x + a_2x^2 + \ldots . a_{n-1}x^{n-1} + a_n x^n$ for given constant 'x' and its co-efficients. **(04 Marks)**

c. Explain string Input/output functions with example. **(05 Marks)**

OR

6 a. Explain how strings are declared and initialized with syntax and example. **(06 Marks)**

b. Write a C program to find the addition of two matrices. **(04 Marks)**

c. Explain function definition, function call and function declaration with example. **(06 Marks)**

Module-4

7 a. Define structure. Explain how structure members are accessed using dot (•) operator with example. **(05 Marks)**

b. Show how structure variables are passed as a parameter to a function with example. **(05 Marks)**

c. Write a C program to maintain record of 'n' students detail using array of structures with four fields (Rno, name, marks, grade). Each field is an appropriate data type. Print the marks of student if student name is given. **(06 Marks)**

OR

8 a. Define file. Explain the different modes of file with suitable examples. **(08 Marks)**

b. Explain the following file function with example.

i) fopen ( )
ii) fprintf ( )
iii) fscanf ( )
iv) fgets ( ) **(08 Marks)**

Module-5

9 a. What is pointer? Explain how pointer variable is declared and initialized. **(05 Marks)**

b. Explain any two preprocessor directives in C with example. **(06 Marks)**

c. Write a C program to swap two numbers using pointer concept. **(05 Marks)**

OR

10 a. What are primitive and non primitive data types? Explain. **(05 Marks)**

b. List the applications of stack and Queue data structure. **(05 Marks)**

c. Write a C program to find sum and mean of all elements in an array using pointer. **(06 Marks)**

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CBCS Scheme

USN | | | | | | | | | | |

15PCD13

First Semester B.E. Degree Examination, Dec.2015/Jan.2016
Programming in C ad Data Structures

Time: 3 hrs. Max. Marks: 80

Note: Answer any FIVE full questions, choosing one full question from each module.

Module-1

1 a. What is variable? Explain the rules for constructing variables in C language. Give examples for valid and invalid variables. **(06 Marks)**

b. Evaluate the following expressions :
i) 100% 20 < = 20 – 5 + 100% 10 – 20 = = 5 > = 1 != 20
ii) a += b *= c –= 5 where a = 3 b = 5 and c = 8. **(04 Marks)**

c. Write a C program to find the area and perimeter of a rectangle. **(06 Marks)**

OR

2 a. Write a C program which takes as input p, t, r. Compute the simple interest and display the result. **(06 Marks)**

b. Convert the following mathematical expression into C expressions :
i) $\frac{x}{b+c}+\frac{y}{b-c}$ ii) $a+\frac{b(ad+e)}{b-a}-\frac{c}{d}$. **(04 Marks)**

c. What is value of "x" in following code segments? Justify your answers :

i)
```
int a, b ;
float x ;
a = 4 ;
b = 5 ;
x = b/a ;
```

ii)
```
int a, b ;
float x ;
a = 4 ;
b = 5 ;
x = (float) b/a ;
```

(06 Marks)

Module-2

3 a. Explain the syntax of do-while statement. Write a C program to find the factorial of a number using do-while, where the number n is entered by user. **(08 Marks)**

b. What is two way selection statement? Explain if, if else, and cascaded if-else with examples. **(08 Marks)**

OR

4 a. Write a C program that takes from user an arithmetic operator ('+', '–', '*' or '/') and two operands. Perform the corresponding arithmetic operation on the operands using switch statement. **(08 Marks)**

b. What is an array? How to declare and initialize the two dimensional array? **(08 Marks)**

Module-3

5 a. What is a function? Write a C program to find the cube of a number using function. **(05 Marks)**

b. Write a C program to check a number is a prime or not using recursion. **(05 Marks)**

c. Write a program to replace each constant in a string with the next one except letter 'z' 'Z' and 'a', 'A'. Thus the string "programming in C is fun" should be modified as "Qsphsannjoh jo D jt gvo". **(06 Marks)**

OR

6 a. Write a C program to sort the elements by passing array as function argument. **(08 Marks)**

b. Write a C program to concatenate two strings without using built – in function strcat( ). **(08 Marks)**

Module-4

7 a. What is structure? Explain the C syntax of structure declaration with example. **(05 Marks)**

b. Write a C program to pass structure variable as function argument. **(07 Marks)**

c. Explain fopen( ) and fclose( ) functions. **(04 Marks)**

OR

8 a. Write a C program to store and print name, USN, subject and IA marks of students using structure. **(08 Marks)**

b. Explain fputc( ) , fputs( ), fgetc( )and fgets( ) functions with syntax. **(08 Marks)**

Module-5

9 a. What is a pointer? Write a C program to find the sum and mean of all elements in an array using pointer. **(08 Marks)**

b. What is stack? Explain its operations with examples. **(08 Marks)**

OR

10 a. Write a C program to swap two numbers using call by address. **(06 Marks)**

b. Explain any five preprocessor directives in C. **(05 Marks)**

c. What are primitive and non–primitive data types? Explain with examples. **(05 Marks)**

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15PCD13/23

First/Second Semester B.E. Degree Examination, Dec.2016/Jan.2017
Programming in C and Data Structures

Time: 3 hrs. Max. Marks: 80

Note: Answer any FIVE full questions, choosing one full question from each module.

Module-1

1 a. Define an Algorithm. Write an algorithm to find the area and perimeter of a rectangle. **(06 Marks)**

b. Write a General structure of C. Explain with an example. **(06 Marks)**

c. Convert the following mathematical expression into C equivalent:

i) area = $\sqrt{s(s-a)(s-b)(s-c)}$

ii) $x = \frac{-b+\sqrt{b^2-4ac}}{2a}$ **(04 Marks)**

OR

2 a. Explain different types of input output functions in C with syntax and examples. **(06 Marks)**

b. Explain the following operators :

i) Unary
ii) Bitwise
iii) Conditional. **(06 Marks)**

c. Draw the flowchart and write a C program to compute simple interest. **(04 Marks)**

Module-2

3 a. List all the conditional control statements used in C. Explain any two with syntax and example. **(06 Marks)**

b. Write a C program that reads from the user an arithmetic operator and two operands perform the corresponding arithmetic operation on the operands using switch statement. **(06 Marks)**

c. Implement a C program to find the reverse of an integer number and check whether it is palindrome or not. **(04 Marks)**

OR

4 a. What are unconditional control statements? Explain any two with example. **(06 Marks)**

b. List the types of looping statements in C. Explain any two with syntax and example. **(06 Marks)**

c. Develop a C program to read a year as an input and find whether it is Leap year or not. **(04 Marks)**

Module-3

5 a. What is Array? Explain the declaration and initialization of one dimensional and two dimensional Array with example. **(06 Marks)**

b. Explain any four string manipulation library function with example. **(04 Marks)**

c. Write a C program to implement string copy operation STRCOPY (str1, str2) that copies a string str1 to another string str2 without using Library function. **(06 Marks)**

OR

6 a. What is string? Write a C program that reads a sentence and prints the frequency of each of the vowels and total count of consonants. **(06 Marks)**

b. What is a Function? Explain the type of functions based on parameters. **(06 Marks)**

c. What is Recursion? Write a C program to compute polynomial co-efficient ${}^{n}C_{r}$ using Recursion. **(04 Marks)**

Module-4

7 a. What is structure? Explain the C Syntax of structure declaration with example. **(04 Marks)**

b. What is a FILE? Explain any five file manipulation functions with example. **(06 Marks)**

c. What are actual and formal parameters? Explain various storage classes available in C. **(06 Marks)**

OR

8 a. Explain array of structure and structure within a structure with an example. **(06 Marks)**

b. Write a C program to maintain a record of 'n' students details using an array of structures with four fields (roll no, name, marks and grade). Assume appropriate data type for each field. Print the marks of the student given the student name as input. **(06 Marks)**

c. Explain various modes of FILE with example. **(04 Marks)**

Module-5

9 a. What is a pointer? Explain how the pointer variable is declared and initialized. **(04 Marks)**

b. What is dynamic memory allocation? Explain different dynamic memory allocation functions in C. **(06 Marks)**

c. Write a C program using pointers to compute the Sum, Mean and Standard deviation of all elements stored in an array of 'n' real numbers. **(06 Marks)**

OR

10 a. Explain the Array of pointers with example. **(04 Marks)**

b. Explain any two pre-processor directives in C. **(04 Marks)**

c. What is Stack? Explain operations on Stack. **(04 Marks)**

d. What is a Queue? Explain its applications. **(04 Marks)**

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First/Second Semester B.E. Degree Examination, Dec.2017/Jan.2018
Programming in C and Data Structures

Time: 3 hrs. Max. Marks: 80

Note: Answer any FIVE full questions, choosing one full question from each module.

Module-1

1 a. What is a variable? Explain the rules for constructing variables in C language. Give examples for valid and invalid variables. **(06 Marks)**

b. Write C expressions corresponding to the following (Assume all quantities are of same type):

i) $A = \frac{-b+\sqrt{b^2-4ac}}{2a}$ ii) $B = e^{|x+y-20|}$ iii) $C = \frac{x}{b+c} + \frac{y}{b-c}$

iv) $D = \sqrt{2\pi n}$ v) $E = \sin\theta$ vi) $F = \sin\left(\frac{b}{\sqrt{a^2+b^2}}\right)$ **(06 Marks)**

c. Write a C program to find area of a circle. **(04 Marks)**

OR

2 a. List all the operators supported in C. Explain relational, logical and bitwise operators. **(08 Marks)**

b. Write a C program to find area of a triangle, when we know the lengths of all three of its sides. **(08 Marks)**

Module-2

3 a. List all the conditional control statements used in C. Explain if...else and nested if statements with example for each. **(08 Marks)**

b. Write a C program to simulate simple calculator that performs arithmetic operations using switch statement. Error message should be displayed, if any attempt is made to divide by zero. **(08 Marks)**

OR

4 a. Explain the different types of loops used in C with syntax and example for each. **(08 Marks)**

b. Write a C program to find the sum of series $1+x+x^2+x^3+.....+x^n$. **(08 Marks)**

Module-3

5 a. What is an array? Explain different methods of initialization of single dimensional array. **(08 Marks)**

b. Write a C program to sort the given array elements in ascending order by using bubble sort. **(08 Marks)**

OR

6 a. Write a C program to compute the factorial of a given number 'n' using recursion. **(08 Marks)**

b. Explain any four string manipulation library functions with example. **(08 Marks)**

Module-4

7 a. Write a C program to input the following details of 'N' students using structure:
Roll_No: integer, Name : string, Marks : float, Grade : Char
Print the names of the students with marks ≥ 70.0. **(08 Marks)**

b. Explain the following file operations along with syntax:
i) fopen( ) ii) fclose( ) iii) fscanf( ) iv) fprintf( ) **(08 Marks)**

OR

8 a. Write a C program to maintain a record of 'n' employee detail using an array of structures with three fields (id, name, salary) and print the details of employees whose salary is above Rs.10,000. **(08 Marks)**

b. Explain structure within a structure with an example. **(08 Marks)**

Module-5

9 a. Define a pointer. Explain with an example, the declaration and initialization of a pointer variable. **(06 Marks)**

b. Develop a C program to read two numbers and function to swap these numbers using pointers. **(06 Marks)**

c. Explain the following C functions along with syntax: i) malloc( ) ii) calloc( ) **(04 Marks)**

OR

10 a. Explain stack and queue data structures along with their applications. **(08 Marks)**

b. Explain any four preprocessor directives in C language with example for each. **(08 Marks)**

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