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# Table of Contents



Note : Remove “Table of Content” before including in CP Book
Each Course Plan shall be printed and made into a book with cover page
Blooms Level in all sections match with A.2, only if you plan to teach / learn at higher levels

# 18CPS13: C programming for problem Solving

## A. COURSE INFORMATION

### 1. Course Overview

| | | | |
|---|---|---|---|
| Degree: | B E | Program: | CS |
| Year / Semester : | 2019/1 | Academic Year: | 2019-20 |
| Course Title: | C programming for problem solving | Course Code: | 18CPS13 |
| Credit / L-T-P: | 2-2-0 | SEE Duration: | 180 Minutes |
| Total Contact Hours: | 40 | SEE Marks: | 60 |
| CIA Marks: | 40 | Assignment | 1 / Module |
| Course Plan Author: | VANITHA T N | Sign | Dt: |
| Checked By: | | Sign | Dt: |

### 2. Course Content

| Module | Module Content | Teaching Hours | Module Concepts | Blooms Level |
|---|---|---|---|---|
| 1 | **Introduction to computer Hardware and software:** Computer generations, computer types, bits, bytes and words, CPU, Primary memory, Secondary memory, ports and connections, input devices, output devices, Computers in a network, Network hardware, Software basics, software types. | 4 | Computer Architecture | L2 Understand |
| | **Overview of C:** Basic structure of C program, executing a C program-Compilation and linking processes<br>**Constant** such as Integer,Real,Floating point,character,string constants<br>**variable**-variable declaration and Initialization<br>**data types-**Void,Integer,Floating Point,Character,Logical data<br>**Operators and expressions** | 4 | C program structure | L2 Understand |
| 2 | **Managing Input and output operations**-Introduction,Reading a character,writing a character,Formatted input and Formatted output,sample program | 4 | Standard Input & Output library | L2 Understand |
| | **Decision Making**-Introduction,Decision making with IF statements,SWITCH statements,Break statements,Continue statements and GOTO statements<br>**Branching and Looping**- Introduction,WHILE statements,Do-While,Switch statements,If-Then-else and its sample programs Finding roots of a quadratic equation, computation of binomial coefficients, plotting of Pascals triangle. | 4 | Program constructs | L2 Understand |
| 3 | **Arrays**: Arrays (1-Dimensional, 2-Dimensional),Declaration, Characteristics, Initialization, Character arrays and Strings | 4 | Structured data representation | L2 Understand |
| | **Basic Algorithms:** Searching and Sorting Algorithms (Linear search, Binary search, Bubble sort and Selection sort). | 4 | data arrangement & probing | L3 Apply |
| 4 | **User Defined Functions**-Introduction, Elements of function, Types of functions, Function Prototype | 4 | Modular programming | L2 Understand |
| | **Recursion**-Definition, Example programs,<br>Finding Factorial of a positive integers and Fibonacci series | 4 | Recursion | L3 Apply |
| 5 | **Structure-**Definition,declaration of structures,Initialization,structure within structure,array of structures,pointer to structures | 4 | User-defined datatype | L3 Apply |
| | **Pointers-**Definition, declaration of pointers, Initialization of pointers,Accessing a variable,Array of pointers, pointers and structures,void pointers, sample programs<br>Preprocessor Directives- macro substitution,inclusion | 4 | Memory representation | L3 Apply |

## 3. Course Material

| Module | Details | Available |
|---|---|---|
| 1 | Text Books | |
| | 1. E. Balaguruswamy,Programming in ANSI C, 7th Edition,Tata McGraw-Hill | Not Available( material requirement given) |
| | 2. Brian W. Kernighan and Dennis M. Ritchie, The C Programming Language, Prentice Hall of India. | Available |
| 2 | Reference books | |
| | 1. Sumitabha Das, Computer Fundamentals & C Programming, Mc Graw Hill Education.<br>2. Gary J Bronson, ANSI C Programming, 4 th Edition, Ceneage Learning.<br>3. Vikas Gupta: Computer Concepts and C Programming, Dreamtech Press 2013.<br>4. R S Bichkar, Programming with C, University Press, 2012.<br>5. V Rajaraman: Computer Programming in C, PHI, 2013.<br>6. Basavaraj S. Anami, Shanmukhappa A Angadi, Sunilkumar S. Manvi, Computer Concepts and C Programming: A Holistic Approach to Learning C, Second edition, PHI India, 2010. | Available |
| 3 | Others (Web, Video, Simulation, Notes etc.) | Available |
| | *https://www.tutorialspoint.com/PPS* | |
| | *https://vtuplanet.com/notes* | |
| | *https://www.khanacademy.com* | |
| | | |

## 4. Course Prerequisites

| SNo | Course Code | Course Name | Module / Topic / Description | Sem | Remarks | Blooms Level |
|---|---|---|---|---|---|---|
| 1 | 18CPS17 | C Programming for problem solving | Familiarize with fundamentals of basics of computer concepts | 1 | Required for Module 1 | l1 |
| | - | - | | - | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

Note: If prerequisites are not taught earlier, GAP in curriculum needs to be addressed. Include in Remarks and implement in B.5.

# B. OBE PARAMETERS

## 1. Course Outcomes

| # | COs | Teach. Hours | Concept | Instr Method | Assessment Method | Blooms' Level |
|---|---|---|---|---|---|---|
| 18CPS13.1 | Understand the working of Computer System | 04 | Computer Architecture | Lecture | Question& Answer Assignment | L2 Understand |
| 18CPS13.2 | Understand the procedure to write a C program and usage of Variables & Operators | 04 | C program structure | Lecture | Question & Answer Assignment | L2 Understand |
| 18CPS13.3 | Understand to read and write the data using Input & Output library functions | 04 | Standard Input & Output library Question & Answer Assignment | Lecture | Question & Answer Assignment | L2 Understand |
| 18CPS13.4 | Understand to construct a | 04 | Program | Lecture | Question & | L2 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | programming solution to a given problem using Branching & Looping constructs | | constructs | | Answer Assignment | Understand |
| 18CPS13.5 | Describe the linear representation of data using arrays | 04 | Structured data representation | Lecture | Question & Answer Assignment | L2 Understand |
| 18CPS13.6 | Develop Algorithms for data arrangement & probing using Searching & Sorting technique | 04 | data arrangement & probing | Lecture | Question & Answer Assignment | L3 Apply |
| 18CPS13.7 | Understand Modular representation of program using User-Defined functions | 04 | Modular programming | Lecture | Question & Answer Assignment | L2 Understand |
| 18CPS13.8 | Develop a C program using Recursion | 04 | Recursion | Lecture | Question & Answer Assignment | L3 Apply |
| 18CPS13.9 | Develop a C program to store the data of different types using structures | 04 | User-defined datatype | Lecture | Question & Answer Assignment | L3 Apply |
| 18CPS13.10 | Develop a C program to store the address of a variable using Pointers | 04 | Memory representation | Lecture | Question & Answer Assignment | L3 Apply |
| - | **Total** | **40** | - | - | - | - |

Note: Identify a max of 2 Concepts per Module. Write 1 CO per concept.

## 2. Course Applications

| SNo | Application Area | CO | Level |
|---|---|---|---|
| 1 | web applications, development tools, image editing programs, and communication programs | CO1 | L2 |
| 2 | To create computer applications,embedded softwares | CO2 | L2 |
| 3 | Computer-aided design,graphical user interfaces,image processing | CO3 | L2 |
| 4 | banking sectors,Theory of Algebra,In Number theory ,DNA sequences | CO4 | L2 |
| 5 | Computer Graphics,Database Management system | CO5 | L2 |
| 6 | Banking sectors | CO6 | L3 |
| 7 | Database Management system | CO7 | L2 |
| 8 | Combinatorial problems,Dynamic programming | CO8 | L3 |
| 9 | Computer Architecture | CO9 | L3 |
| 10 | System programming | CO10 | L3 |

Note: Write 1 or 2 applications per CO.

## 3. Articulation Matrix

**(CO – PO MAPPING)**

| - | Course Outcomes | Program Outcomes | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| # | COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO 6 | PO7 | PO 8 | PO9 | PO1 0 | PO1 1 | PO1 2 | Level |
| 18CPS13.1 | Understand the working of computer system | 2 | | | | | | | | | | | | L2 |
| 18CPS13.2 | Understand the procedure to write a C program using operators and expressions | 1 | | | | | | | | | | | | L2 |
| 18CPS13.3 | Understand to read and write the data using Input & Output library functions | 1 | | | | | | | | | | | | L2 |
| 18CPS13.4 | Understand to construct a programming solution to a given problem using Branching & Looping constructs | 1 | 2 | | | | | | | | | | | L2 |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 18CPS13.5 | Describe the linear representation of data using arrays | 1 | 2 | 3 | | | | | | | | | | L2 |
| 18CPS13.6 | Develop Algorithms for data arrangement & probing using Searching & Sorting technique | 1 | 3 | 3 | | | | | | | | | | L3 |
| 18CPS13.7 | Understand Modular representation of program using User-Defined functions | 1 | 2 | 2 | | | | | | | | | | L2 |
| 18CPS13.8 | Develop a C program using Recursion | 1 | 2 | 3 | | | | | | | | | | L3 |
| 18CPS13.9 | Develop a C program to store the data of different types using structures | 1 | 2 | 3 | | | | | | | | | | L3 |
| 18CPS13.10 | Develop a C program to store the address of a variable using Pointers | 1 | 2 | 3 | | | | | | | | | | L3 |
| **18CPS18** | Average | | | | | | | | | | | | | |
| **Note: Mention the mapping strength as 1, 2, or 3** | | | | | | | | | | | | | | |

## 4. Mapping Justification

| Mapping | | Justification | Mapping Level |
|---|---|---|---|
| **CO** | **PO** | **-** | **-** |
| CO1 | PO1 | Knowledge of Basic parts of Computer, and its working is discussed. | 2 |
| | PO2 | No Analyzing. No mapping | - |
| | PO3 | No design &development content, No mapping, Attainment will be Zero, if mapping done. | - |
| | PO4 | No investigation & interpretation content. No mapping. Learning is at the basic level. Attainment will be Zero, if mapping done. | - |
| | PO5 | No tool content. No mapping | - |
| | PO6 | No social, cultural issues. No mapping | - |
| | PO7 | No impact on Environment and sustainability. No mapping | - |
| | PO8 | No team work or lead for the ethical work. No mapping | - |
| | PO9 | No team work or lead for the ethical work. No mapping | - |
| | PO10 | No usage for communication. No mapping. | - |
| | PO11 | No project management and finance. No mapping. | - |
| | PO12 | No mapping as there is only understanding | - |
| CO2 | PO1 | Basic Structure of C program and its Concepts are discussed. | 1 |
| | PO2 | No Analyzing. No mapping | - |
| | PO3 | No design &development content, No mapping, Attainment will be Zero, if mapping done. | - |
| | PO4 | No investigation & interpretation content. No mapping. Learning is at the basic level. Attainment will be Zero, if mapping done. | - |
| | PO5 | No tool content. No mapping | - |
| | PO6 | No social, cultural issues. No mapping | - |
| | PO7 | No impact on Environment and sustainability. No mapping | - |
| | PO8 | No team work or lead for the ethical work. No mapping | - |
| | PO9 | No team work or lead for the ethical work. No mapping | - |
| | PO10 | No usage for communication. No mapping. | - |
| | PO11 | No project management and finance. No mapping. | - |
| | PO12 | No mapping as there is only understanding | - |
| CO3 | PO1 | Understanding the procedures to read and write I/O functions | 1 |
| | PO2 | No Analyzing. No mapping | - |
| | PO3 | No design &development content, No mapping, Attainment will be | - |

| | | | |
|---|---|---|---|
| | | Zero, if mapping done. | |
| | PO4 | No investigation & interpretation content. No mapping. Learning is at the basic level. Attainment will be Zero, if mapping done. | - |
| | PO5 | No tool content. No mapping | - |
| | PO6 | No social, cultural issues. No mapping | - |
| | PO7 | No impact on Environment and sustainability. No mapping | - |
| | PO8 | No team work or lead for the ethical work. No mapping | - |
| | PO9 | No team work or lead for the ethical work. No mapping | - |
| | PO10 | No usage for communication. No mapping. | - |
| | PO11 | No project management and finance. No mapping. | - |
| | PO12 | No mapping as there is only understanding | - |
| CO4 | PO1 | Understanding the Concepts of C Language | 1 |
| | PO2 | analyze the problem to use relevant Branching and looping Constructs | 2 |
| | PO3 | No design &development content, No mapping, Attainment will be Zero, if mapping done. | - |
| | PO4 | No investigation & interpretation content. No mapping. Learning is at the basic level. Attainment will be Zero, if mapping done. | - |
| | PO5 | No tool content. No mapping | - |
| | PO6 | No social, cultural issues. No mapping | - |
| | PO7 | No impact on Environment and sustainability. No mapping | - |
| | PO8 | No team work or lead for the ethical work. No mapping | - |
| | PO9 | No team work or lead for the ethical work. No mapping | - |
| | PO10 | No usage for communication. No mapping. | - |
| | PO11 | No project management and finance. No mapping. | - |
| | PO12 | No mapping as there is only understanding | - |
| CO5 | PO1 | Understanding the Concepts of arrays | 1 |
| | PO2 | analyse the problem by using the knowledge of arrays | 2 |
| | PO3 | design and develop the program requires the knowledge of arrays. | 3 |
| | PO4 | No investigation & interpretation content. No mapping. Learning is at the basic level. Attainment will be Zero, if mapping done. | - |
| | PO5 | No tool content. No mapping | - |
| | PO6 | No social, cultural issues. No mapping | - |
| | PO7 | No impact on Environment and sustainability. No mapping | - |
| | PO8 | No team work or lead for the ethical work. No mapping | - |
| | PO9 | No team work or lead for the ethical work. No mapping | - |
| | PO10 | No usage for communication. No mapping. | - |
| | PO11 | No project management and finance. No mapping. | - |
| | PO12 | No mapping as there is only understanding | - |
| CO6 | PO1 | Understanding the Concepts of arrays | 1 |
| | PO2 | analyse the problem by using the knowledge of arrays | 3 |
| | PO3 | design and develop the algorithms for sorting and searching techniques | 3 |
| | PO4 | No investigation & interpretation content. No mapping. Learning is at the basic level. Attainment will be Zero, if mapping done. | - |
| | PO5 | No tool content. No mapping | - |
| | PO6 | No social, cultural issues. No mapping | - |
| | PO7 | No impact on Environment and sustainability. No mapping | - |
| | PO8 | No team work or lead for the ethical work. No mapping | - |
| | PO9 | No team work or lead for the ethical work. No mapping | - |
| | PO10 | No usage for communication. No mapping. | - |
| | PO11 | No project management and finance. No mapping. | - |
| | PO12 | No mapping as there is only understanding | - |
| CO7 | PO1 | Understanding the modular representation of a program,, | 1 |
| | PO2 | analyze the problem requires the knowledge of elements of | 2 |

| | | | |
|---|---|---|---|
| | | functions | |
| | PO3 | Design and develop the program requires the knowledge of functions | 2 |
| | PO4 | No investigation & interpretation content. No mapping. Learning is at the basic level. Attainment will be Zero, if mapping done. | - |
| | PO5 | No tool content. No mapping | - |
| | PO6 | No social, cultural issues. No mapping | - |
| | PO7 | No impact on Environment and sustainability. No mapping | - |
| | PO8 | No team work or lead for the ethical work. No mapping | - |
| | PO9 | No team work or lead for the ethical work. No mapping | - |
| | PO10 | No usage for communication. No mapping. | - |
| | PO11 | No project management and finance. No mapping. | - |
| | PO12 | No mapping as there is only understanding | - |
| CO8 | PO1 | Understanding the Concept of recursion,,. | 1 |
| | PO2 | analyze the problem requires the knowledge of elements of functions | 2 |
| | PO3 | Design and develop the program requires the knowledge of recursion | 3 |
| | PO4 | No investigation & interpretation content. No mapping. Learning is at the basic level. Attainment will be Zero, if mapping done. | - |
| | PO5 | No tool content. No mapping | - |
| | PO6 | No social, cultural issues. No mapping | - |
| | PO7 | No impact on Environment and sustainability. No mapping | - |
| | PO8 | No team work or lead for the ethical work. No mapping | - |
| | PO9 | No team work or lead for the ethical work. No mapping | - |
| | PO10 | No usage for communication. No mapping. | - |
| | PO11 | No project management and finance. No mapping. | - |
| | PO12 | No mapping as there is only understanding | - |
| CO9 | PO1 | Understanding the Concept of Structures | 1 |
| | PO2 | analyze the problem requires the knowledge of elements of Structures | 2 |
| | PO3 | Design and develop the program requires the knowledge of Structures | 3 |
| | PO4 | No investigation & interpretation content. No mapping. Learning is at the basic level. Attainment will be Zero, if mapping done. | - |
| | PO5 | No tool content. No mapping | - |
| | PO6 | No social, cultural issues. No mapping | - |
| | PO7 | No impact on Environment and sustainability. No mapping | - |
| | PO8 | No team work or lead for the ethical work. No mapping | - |
| | PO9 | No team work or lead for the ethical work. No mapping | - |
| | PO10 | No usage for communication. No mapping. | - |
| | PO11 | No project management and finance. No mapping. | - |
| | PO12 | No mapping as there is only understanding | - |
| CO10 | PO1 | Understanding the Concept of Pointers | 1 |
| | PO2 | analyze the problem requires the knowledge of Pointers | 2 |
| | PO3 | Design and develop the program requires the knowledge of Pointers | 3 |
| | PO4 | No investigation & interpretation content. No mapping. Learning is at the basic level. Attainment will be Zero, if mapping done. | - |
| | PO5 | No tool content. No mapping | - |
| | PO6 | No social, cultural issues. No mapping | - |
| | PO7 | No impact on Environment and sustainability. No mapping | - |
| | PO8 | No team work or lead for the ethical work. No mapping | - |
| | PO9 | No team work or lead for the ethical work. No mapping | - |
| | PO10 | No usage for communication. No mapping. | - |
| | PO11 | No project management and finance. No mapping. | - |

| | | | |
|---|---|---|---|
| | PO12 | No mapping as there is only understanding. | - |

Note: Write justification for each CO-PO mapping.

## 5. Curricular Gap and Content

| SNo | Gap Topic | Actions Planned | Schedule Planned | Resources Person | PO Mapping |
|---|---|---|---|---|---|
| 1 | | | | | |
| 2 | | | | | |
| 3 | | | | | |
| 4 | | | | | |
| 5 | | | | | |
| | | | | | |
| | | | | | |

Note: Write Gap topics from A.4 and add others also.

## 6. Content Beyond Syllabus

| SNo | Gap Topic | Actions Planned | Schedule Planned | Resources Person | PO Mapping |
|---|---|---|---|---|---|
| 1 | | | | | |
| 2 | | | | | |
| 3 | | | | | |
| 4 | | | | | |
| 5 | | | | | |
| 6 | | | | | |
| 7 | | | | | |
| 8 | | | | | |
| 9 | | | | | |
| 10 | | | | | |
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| | | | | | |
| | | | | | |

Note: Anything not covered above is included here.

# C. COURSE ASSESSMENT

## 1. Course Coverage

| Module # | Title | Teaching Hours | No. of question in Exam | | | | | | CO | Levels |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | CIA-1 | CIA-2 | CIA-3 | Asg | Extra Asg | SEE | | |
| 1 | Introduction to computer Hardware and Software,Overview of C | 08 | 2 | - | - | 1 | - | 2 | CO1, CO2 | L2 |
| 2 | Managing Input and output operations,Conditional Branching and loops | 08 | 2 | - | - | 1 | - | 2 | CO3, CO4 | L2 |
| 3 | Arrays, Basic algorithms | 08 | - | 2 | - | 1 | - | 2 | CO5, CO6 | L2, L3 |
| 4 | User-defined functions and Recursion | 08 | - | 2 | | 1 | - | 2 | CO7, C08 | L2, L3 |
| 5 | Structures and Pointers, Preprocessor Directives | 08 | - | - | 4 | 1 | - | 2 | CO9, CO10 | L3 |
| **-** | **Total** | **40** | **4** | **4** | **4** | **5** | **-** | **10** | **-** | **-** |

Note: Distinct assignment for each student. 1 Assignment per chapter per student. 1 seminar per test per student.

## 2. Continuous Internal Assessment (CIA)

| Evaluation | Weightage in Marks | CO | Levels |
|---|---|---|---|
| CIA Exam – 1 | 30 | CO1, CO2, CO3, CO4 | L2, L2, L2, L2 |

CS
Prepared by Checked by Approved

| | | | |
|---|---|---|---|
| CIA Exam – 2 | 30 | CO5, CO6, CO7, C08 | L2, L3, L2, L3 |
| CIA Exam – 3 | 30 | CO9, CO10 | L3, L3 |
| | | | |
| Assignment - 1 | 10 | CO1, CO2, CO3, CO4 | L2, L2, L2, L2 |
| Assignment - 2 | 10 | CO5, CO6, CO7, CO8 | L2, L3, L2, L3 |
| Assignment - 3 | 10 | CO9, CO10 | L3, L3 |
| | | | |
| Seminar - 1 | - | - | - |
| Seminar - 2 | - | - | - |
| Seminar - 3 | - | - | - |
| | | | |
| Other Activities – define – Slip test | - | - | - |
| **Final CIA Marks** | **40** | **-** | **-** |

Note : Blooms Level in last column shall match with A.2 above.

## D1. TEACHING PLAN - 1

### Module - 1

| Title: | Introduction to computer Hardware and Software,Overview of C | Appr Time: | 08 Hrs |
|---|---|---|---|
| **a** | ***Course Outcomes*** | - | **Blooms** |
| - | The student should be able to: | - | **Level** |
| 1 | Understand the working of computer system | CO1 | L2 |
| 2 | Understand the procedure to write a C program using operators and expressions | CO2 | L2 |
| | | | |
| **b** | ***Course Schedule*** | - | - |
| **Class No** | **Module Content Covered** | **CO** | **Level** |
| 1 | Introduction to computer Hardware and software: Computer generations | C01 | L1 |
| 2 | computer types, bits,bytes and words, CPU | C01 | L2 |
| 3 | Primary memory, Secondary memory,ports and connections, input devices | C01 | L2 |
| 4 | output devices, Computers in a network | C01 | L2 |
| 5 | Network hardware, Software basics, software types | C01 | L2 |
| 6 | Overview of C: Basic structure of C program | C02 | L2 |
| 7 | executing a C program | C02 | L2 |
| 8 | Constant | C02 | L2 |
| 9 | variable | C02 | L2 |
| 10 | data types | C02 | L2 |
| 11 | Operators and expressions | C02 | L2 |
| | | | |
| **c** | **Application Areas** | **CO** | **Level** |
| 1 | web applications, development tools, image editing programs, and communication programs | CO1 | L2 |
| 2 | To create computer applications,embedded softwares | CO2 | L2 |
| | | | |
| **d** | **Review Questions** | - | - |
| 1 | What is a Computer? Explain the parts of Computer. | CO1 | L1 |
| 2 | Define i) bits ii) bytes iii)words | CO1 | L1 |
| 3 | Explain Input and Output devices in detail. | CO1 | L2 |
| 4 | List and explain basic components of computer network. | CO1 | L2 |
| 5 | Define Software. Explain its types. | CO1 | L2 |
| 6 | What is a token? What are different types of tokens available in C language? explain | CO2 | L2 |
| 7 | Explain structure of C program with an example. | CO2 | L2 |
| 8 | Define: i) variable ii) Constant iii) Associativity iv) precedence. | CO2 | L2 |

| | | | |
|---|---|---|---|
| 9 | Explain any five operators used in C language. | CO2 | L2 |
| 10 | What are datatypes? Mention the different datatypes supported by C language, giving an example to each. | CO2 | L2 |
| 11 | Write a C program to find area of a circle. | CO2 | L2 |
| 12 | What is an algorithm? Write an algorithm to find largest of 3 numbers | CO2 | L2 |
| 13 | Convert the following mathematical expressions into C equivalent:<br>i) area= $\sqrt{s(s-a)(s-b)(s-c)}$<br>ii) x= -b + $\sqrt{b2-4ac}$ /2a | CO2 | L2 |
| | | | |
| **e** | **Experiences** | - | - |
| 1 | | | |
| 2 | | | |
| 3 | | | |
| 4 | | | |

## Module – 2

| Title: | Managing Input and output operations, Conditional Branching and loops | Appr Time: | 10 Hrs |
|---|---|---|---|
| **a** | ***Course Outcomes*** | - | **Blooms** |
| - | The student should be able to: | - | **Level** |
| 1 | Understand to read and write the data using Input & Output library functions | CO3 | L2 |
| 2 | Understand to construct a programming solution to a given problem using Branching & Looping constructs | CO4 | L2 |
| | | | |
| **b** | ***Course Schedule*** | - | - |
| **Class No** | **Module Content Covered** | **CO** | **Level** |
| 12 | Managing Input and output operations,Introduction | CO3 | L2 |
| 13 | Reading a character,writing a character | CO3 | L2 |
| 14 | Formatted input and Formatted output,sample program | CO3 | L2 |
| 15 | Formatted input and Formatted output,sample program | CO3 | L2 |
| 16 | Decision Making-Introduction,Decision making with IF statements,SWITCH statements,Break statements,Continue statements and GOTO statements | CO4 | L2 |
| 17 | Branching and Looping- Introduction,WHILE statements,Do-While,Switch statements,If-Then-else and its sample programs | CO4 | L2 |
| 18 | Finding roots of a quadratic equations | CO4 | L2 |
| 19 | computation of binomial coefficients | CO4 | L2 |
| 20 | plotting of Pascals triangle. | CO4 | L2 |
| | | | |
| **c** | **Application Areas** | **CO** | **Level** |
| 1 | Computer-aided design,graphical user interfaces,image processing | CO3 | L2 |
| 2 | banking sectors,Theory of Algebra,In Number theory ,DNA sequences | CO4 | L2 |
| | | | |
| **d** | **Review Questions** | - | - |
| 14 | Explain printf and scanf functions with example | CO3 | L2 |
| 15 | List all the conditional control statements used in C. Write a C program to find the biggest of three numbers. | CO4 | L2 |
| 16 | Implement a C program to find the reverse of an integer number and check whether it is palindrome or not | CO3 | L2 |
| 17 | Explain SWITCH statement, with syntax and example | CO4 | L2 |
| 18 | Differentiate between WHILE and DO-WHILE loops | CO4 | L2 |
| 19 | Develop a C program to read a year as an input and find whether it is Leap or not | CO4 | L2 |
| 20 | Explain the syntax of WHILE statement. Write a C program to check the given number is palindrome or not | CO4 | L2 |
| 21 | Distinguish between the following: | CO4 | L2 |

| | | | |
|---|---|---|---|
| | i) goto and if ii) break and continue | | |
| 22 | List all the branching statements and Looping statements | CO4 | L2 |
| 23 | List all unconditional statements and explain with syntax | CO4 | L2 |
| | | | |
| **e** | **Experiences** | | |
| 1 | | | |
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## E1. CIA EXAM – 1

### a. Model Question Paper - 1

| Crs Code: | 18CPS13 | Sem: | 1 | Marks: | 30 | Time: | 90 minutes |
|---|---|---|---|---|---|---|---|
| Course: | C programming for problem solving | | | | | | |

| - | - | **Note: Answer any ONE FULL question from each Module, each carry equal marks.** | **Marks** | **CO** | **Level** |
|---|---|---|---|---|---|
| | | **MODULE-1** | | | |
| 1 | a | What is Computer? Explain its parts. | 03 | CO1 | L1 |
| | b | Explain primary and secondary memory devices in detail. | 04 | CO1 | L2 |
| | c | List all operators supported in C. Explain relational, logical and bitwise operator with example. | 05 | CO2 | L2 |
| | d | Write a C program to find the area of triangle, when we know the length of all three sides. | 03 | CO2 | L2 |
| | | **OR** | | | |
| 2 | a | Explain input and output devices with example | 04 | CO1 | L2 |
| | b | Explain different network topologies with relevant diagram | 05 | CO1 | L2 |
| | c | What is a variable? Explain the rules for constructing variables in c language | 04 | CO2 | L2 |
| | d | Convert the following mathematical expressions into C expressions: i) $\frac{x}{b+c} + \frac{y}{b-c}$ ii) $a + \frac{b(ad+e)}{b-a} - \frac{c}{d}$ | 02 | CO2 | L2 |
| | | **MODULE-2** | | | |
| 3 | a | Explain with syntax and example: i) Input() ii) Output() | 04 | CO3 | L2 |
| | b | Explain the two way selection(if,if-else, nested if-else, cascaded if-else) in C language with syntax | 04 | CO4 | L2 |
| | c | Write a program to find area and perimeter of a circle | 03 | CO4 | L2 |
| | d | Using Switch statement implement simple calculator program | 04 | CO4 | L2 |
| | | **OR** | | | |
| 4 | a | Write the guidelines to use scanf() & printf() functions in C language | 03 | CO3 | L2 |
| | b | Write a C program to find the roots of Quadratic equation | 04 | CO4 | L2 |
| | c | What is a loop? Explain the different loops in C language | 04 | CO4 | L2 |
| | d | Write a C program to compute binomial coefficients | 04 | CO4 | L2 |

### b. Assignment -1

Note: A distinct assignment to be assigned to each student.

| Model Assignment Questions | | | | | | | |
|---|---|---|---|---|---|---|---|
| Crs Code: | 18CPS13 | Sem: | 1 | Marks: | 5 / 10 | Time: | 90 – 120 minutes |
| Course: | C programming for problem solving | | | | | | |

Note: Each student to answer 2-3 assignments. Each assignment carries equal mark.

| SNo | USN | Assignment Description | Marks | CO | Level |
|---|---|---|---|---|---|
| 1 | | Write a note on generations of computer. | | CO1 | L1 |
| 2 | | Explain input and Output Devices in detail. | | CO1 | L2 |
| 3 | | Explain Primary memory and secondary memory storage. | | CO1 | L2 |
| 4 | | Explain Network Typologies | | CO1 | L2 |

| | | | | | |
|---|---|---|---|---|---|
| 5 | | Define the following: i) bits ii) bytes iii) words | | CO1 | L2 |
| 6 | | Define Software. Explain its types. | | CO1 | L2 |
| 7 | | Write basic structure of C program and explain its different sections. | | CO2 | L2 |
| 8 | | What are the rules to be followed to declare an identifier with example. | | CO2 | L2 |
| 9 | | Define C tokens. List and explain different c-tokens. | | CO2 | L2 |
| 10 | | List and Explain all the operators supported in C with an example. | | CO2 | L2 |
| 11 | | Evaluate the following expressions:<br>i) 100% 20<=20-5 + 100% 10 – 20 == 5 >=1!=20<br>ii) a+=b *=c -=5 where a = 3 b=5 and c=8 | | CO2 | L2 |
| 12 | | write a C program to demonstrate working of these logical operators. | | CO2 | L2 |
| 13 | | Explain formatted input output statements in C with syntax and example. Write a C program to find the area and perimeter of a rectangle | | CO3 | L2 |
| 14 | | What is two-way selection statement? Explain if, if else and cascaded if-else with examples. | | CO4 | L2 |
| 15 | | Explain the different types of loops used in C with syntax and example for each | | CO4 | L2 |
| 16 | | Explain the use of break and continue statement in loops with example | | CO4 | L2 |
| 17 | | Explain the Switch statement with syntax and example | | CO4 | L2 |
| 18 | | Explain Ternary operator with suitable example | | CO4 | L2 |
| 19 | | Write a C program to find the roots of Quadratic equation. | | CO4 | L2 |
| 20 | | Write a C program to convert a decimal number to binary form | | CO4 | L2 |
| 21 | | Write a C program to find the sum of series $1+x+x^2+x^3+\ldots+x^n$ | | CO4 | L2 |
| 22 | | Write a C program to plot a Pascals triangle | | CO4 | L2 |

## D2. TEACHING PLAN -2

### Module – 3

| Title: | Arrays, Character arrays and strings, Basic Algorithms | Appr Time: | 08Hrs |
|---|---|---|---|
| **a** | ***Course Outcomes*** | - | **Blooms** |
| - | The student should be able to: | - | **Level** |
| 1 | Describe the linear representation of data using arrays | CO5 | L2 |
| 2 | Develop Algorithms for data arrangement & probing using Searching & Sorting technique | CO6 | L3 |
| | | | |
| **b** | ***Course Schedule*** | | |
| **Class No** | **Module Content Covered** | **CO** | **Level** |
| 21 | Arrays(1-Dimensional,2 Dimensional),Declaration,Characteristics,Initialization | CO5 | L2 |
| 22 | Character arrays | CO5 | L2 |
| 23 | Declaration and Initialization of Strings | CO5 | L2 |
| 24 | Display of strings with different formats | CO5 | L2 |
| 25 | string standard functions, | CO5 | L2 |
| 26 | string arrays | CO5 | L2 |
| 27 | Searching and Sorting Algorithms -Linear search | CO6 | L3 |
| 28 | Binary search | CO6 | L3 |
| 29 | Bubble sort | CO6 | L3 |
| 30 | Selection sort | CO6 | L3 |
| | | | |
| **c** | **Application Areas** | **CO** | **Level** |
| 1 | Computer Graphics,Database Management system | CO5 | L2 |
| 2 | Banking sectors | CO6 | L3 |

| | | | |
|---|---|---|---|
| **d** | **Review Questions** | - | - |
| 1 | What is an ARRAY? Explain the different ways of initializing an array with example | CO5 | L2 |
| 2 | Write a C program to find sum of array elements by passing array as function argument | CO5 | L3 |
| 3 | Explain the different ways of declaring an array with example | CO5 | L2 |
| 4 | Explain any four string manipulation library function with example | CO5 | L2 |
| 5 | 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 | CO5 | L3 |
| 6 | Write a C program to search a name in a list of names using Binary Searching technique | CO6 | L3 |
| 7 | Write a C program to sort the given array elements in ascending order by selection sort | CO6 | L3 |
| 8 | Write a C program to concatenate two strings without using built-in function strcat() | CO5 | L3 |
| 9 | Explain with program: i) String Reverse ii) String Copy iii) String Compare | CO5 | L2 |
| 10 | Write a C program to implement string copy operation STRCOPY(str1,str2) that copies a string str1 to another str2 without using Library function | CO5 | L3 |
| **e** | **Experiences** | - | - |
| 1 | | | |
| 2 | | | |
| 3 | | | |
| 4 | | | |
| 5 | | | |

## Module – 4

| Title: | User Defined Functions and Recursion | Appr Time: | 08 Hrs |
|---|---|---|---|
| **a** | ***Course Outcomes*** | - | **Blooms** |
| - | The student should be able to: | - | **Level** |
| 1 | Understand Modular representation of program using User-Defined functions | CO7 | L2 |
| 2 | Develop a C program using Recursion | CO8 | L3 |
| | | | |
| **b** | ***Course Schedule*** | | |
| **Class No** | **Module Content Covered** | **CO** | **Level** |
| 31 | Introduction, Elements of function | CO7 | L2 |
| 32 | Types of functions | CO7 | L2 |
| 33 | Function Prototype | CO7 | L2 |
| 34 | Recursion-Definition | CO8 | L3 |
| 35 | Example programs using recursion | CO8 | L3 |
| 36 | Finding Factorial of a positive integers | CO8 | L3 |
| 37 | Finding Fibonacci series of a number using recursion | CO8 | L3 |
| | | | |
| **c** | **Application Areas** | **CO** | **Level** |
| 1 | Database Management system | CO7 | L3 |
| 2 | Combinatorial problems,Dynamic programming | CO8 | L3 |
| | | | |
| **d** | **Review Questions** | - | - |
| 11 | Define User-defined function? Write a function to find the sum of two numbers | CO7 | L2 |
| 12 | Write a C program that invokes the function isprime() that accepts an integer argument and returns 1 if argument is isprime() else 0 | CO7 | L3 |
| 13 | Explain the types of function based on parameters | CO7 | L2 |
| 14 | Define the following: i) Actual parameter ii) Formal parameter | CO7 | L2 |

| | | | |
|---|---|---|---|
| 15 | Explain with example to each i) function call ii) function definition iii) function prototype | CO7 | L2 |
| 16 | Write a function power that computes x raised to the power y for integers x and y and returns double type value | CO7 | L3 |
| 17 | Write a C program to find the square root of a given number N using user defined function | CO7 | L3 |
| 18 | Write a C program to compute sin(x) using Taylor series. | CO7 | L3 |
| 19 | Define Recursion. Write a C program to find the fibonacci series using recursion | CO8 | L3 |
| 20 | Write a C program to find the factorial of a given number. | CO8 | L3 |
| | | | |
| **e** | **Experiences** | - | - |
| 1 | | CO7 | L2 |
| 2 | | | |
| 3 | | | |
| 4 | | CO8 | L3 |
| 5 | | | |

## E2. CIA EXAM – 2

### a. Model Question Paper - 2

| Crs Code: | 18CPS13 | Sem: | 1 | Marks: | 30 | Time: | 90 minutes |
|---|---|---|---|---|---|---|---|
| Course: | C programming for problem solving | | | | | | |

| - | - | **Note: Answer any ONE FULL question from each Module, each carry equal marks.** | **Marks** | **CO** | **Level** |
|---|---|---|---|---|---|
| | | **MODULE-3** | | | |
| 1 | a | What is an array? Explain different methods of initialization and declaration of one dimensional array | 03 | CO5 | L2 |
| | b | Write a C program to implement Matrix multiplication using two dimensional arrays | 04 | CO5 | L3 |
| | c | Write a C program to concatenate 2 strings without using Built-in function | 05 | CO5 | L3 |
| | d | List different types of searching techniques and explain any one | 03 | CO6 | L2 |
| | | **OR** | | | |
| 2 | a | What is an array? Explain different methods of initialization and declaration of two dimensional array | 04 | CO5 | L2 |
| | b | Write a C program to sort the given array elements in descending order using bubble sort | 05 | CO5 | L3 |
| | c | Explain all String manipulation library functions with examples | 04 | CO5 | L2 |
| | d | List different types of sorting techniques and explain any one | 02 | CO6 | L2 |
| | | **MODULE-4** | | | |
| 3 | a | What is a function? Explain two categories of argument passing techniques with examples | 04 | CO7 | L2 |
| | b | Explain the following with an example: i)function call ii) function definition iii) function prototype | 03 | CO7 | L2 |
| | c | Write a C program to find the sum of array elements by passing array as function argument | 04 | CO7 | L3 |
| | d | Write a C program to find factorial of a positive integer | 04 | CO8 | L3 |
| | | **OR** | | | |
| 4 | a | What are actual and formal parameters | 03 | CO7 | L2 |
| | b | Write a C program to implement string operations without using built-in functions | 04 | CO7 | L3 |
| | c | Write a C program to implement Tower of hanoi using recursion | 04 | CO8 | L3 |
| | d | Write a C program to find prime or not using Recursion | 04 | CO8 | L3 |

## b. Assignment – 2

Note: A distinct assignment to be assigned to each student.

| Model Assignment Questions | | | | | | | |
|---|---|---|---|---|---|---|---|
| Crs Code: | 18CPS13 | Sem: | 1 | Marks: | 5 / 10 | Time: | 90 – 120 minutes |
| Course: | C Programming for Problem Solving | | | | | | |
| Note: Each student to answer 2-3 assignments. Each assignment carries equal mark. | | | | | | | |

| SNo | USN | Assignment Description | Marks | CO | Level |
|---|---|---|---|---|---|
| 1 | | What is an array? Explain the declaration and initialization of one dimensional arrays with example | | CO5 | L2 |
| 2 | | Explain the declaration and initialization of two dimensional arrays with example | | CO5 | L2 |
| 3 | | Write a C program to read N integers into an array A and to i)find the sum of odd numbers ii) find the sum of even numbers iii) find the average of all numbers Output the results computed with appropriate headings | | CO5 | L3 |
| 4 | | How string is declared and Initialized? Explain any Four string manipulation functions with examples | | CO5 | L2 |
| 5 | | Write a C Program to sort the given array elements in ascending order by Bubble sort technique | | CO6 | L3 |
| 6 | | Write a C Program to search a key element in an array using linear search technique | | CO6 | L3 |
| 7 | | What is function? Explain two categories of argument passing techniques with examples | | CO7 | L2 |
| 8 | | Write a C program to find cube of a number using function | | CO7 | L3 |
| 9 | | Explain the elements of User defined function | | CO7 | L2 |
| 10 | | Explain function call, function definition and function prototype with example to each | | CO7 | L2 |
| 11 | | What are actual parameters and formal parameters? Illustrate with example | | CO7 | L2 |
| 12 | | What is recursion? Write a C program to compute the factorial of a given number 'n' using recursion | | CO8 | L3 |
| 13 | | Write a C program to compute polynomial coefficient ${}^{n}C_{r}$ using recursion | | CO8 | L3 |

## D3. TEACHING PLAN - 3

### Module – 5

| Title: | Structure and Pointers,Preprocessor Directives | Appr Time: | 08 Hrs |
|---|---|---|---|
| **a** | ***Course Outcomes*** | - | **Blooms** |
| - | The student should be able to: | - | **Level** |
| 1 | Develop a C program to store the data of different types using structures | CO9 | L3 |
| 2 | Develop a C program to store the address of a variable using Pointers and usage of Preprocessor directives | CO10 | L3 |
| | | | |
| **b** | ***Course Schedule*** | | |
| **Class No** | **Module Content Covered** | **CO** | **Level** |
| 38 | Structure Definition, declaration of structures | CO9 | L3 |
| 39 | Initialization,structure within structure | CO9 | L3 |
| 40 | array of structures,pointer to structures | CO9 | L3 |
| 41 | Pointer Definition, declaration of pointers | CO10 | L3 |
| 42 | Initialization of pointers,Accessing a variable | CO10 | L3 |
| 43 | Array of pointers,pointers and structures | CO10 | L3 |
| 44 | void pointers,sample programs | CO10 | L3 |
| 45 | Preprocessor Directives- macro substitution,inclusion | CO10 | L3 |
| | | | |

CS
Prepared by Checked by Approved

| c | **Application Areas** | **CO** | **Level** |
|---|---|---|---|
| 1 | Computer Architecture | CO9 | L3 |
| 2 | System programming | CO10 | L3 |
| | | | |
| **d** | **Review Questions** | - | - |
| 1 | What is structure? Explain its declaration and initialization with an example | CO9 | L3 |
| 2 | Write a C program to pass structure variable as function arguments | CO9 | L3 |
| 3 | Write a note on the following with an example for each:<br>I) Arrays of structures ii) arrays within structures iii) structures within structures | CO9 | L3 |
| 4 | Show how a structure variable is passed as a parameter to a function,with an example | CO9 | L3 |
| 5 | How structure is different from an array? Explain declaration of structure with an example | CO9 | L3 |
| 6 | Define point variable. Explain with an example, the declaration and Initialization of variable | CO10 | L3 |
| 7 | Write the difference between array and structure | CO9 | L3 |
| 8 | Give the advantages and disadvantages of pointer datatype | CO10 | L3 |
| 9 | Write and Explain any five preprocessor directives in C | CO10 | L3 |
| 10 | Explain malloc(),calloc() functions with examples | CO10 | L3 |
| | | | |
| **e** | **Experiences** | - | - |
| 1 | | | |
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| 5 | | | |

## E3. CIA EXAM – 3

### a. Model Question Paper - 3

| Crs Code: | 18CPS13 | Sem: | 1 | Marks: | 30 | Time: | 90 minutes |
|---|---|---|---|---|---|---|---|
| Course: | C Programming for Problem Solving | | | | | | |

| - | - | **Note: Answer any ONE FULL question from each Module, each carry equal marks.** | **Marks** | **CO** | **Level** |
|---|---|---|---|---|---|
| | | **MODULE-5** | | | |
| 1 | a | Define structure? Write a C program to store and print name,USN,subject and IA marks of students using structure | 05 | CO9 | L3 |
| | b | Explain array of pointers with example | 05 | CO10 | L3 |
| | c | Explain #define and #include preprocessor directives | 05 | CO10 | L3 |
| | | **OR** | | | |
| 2 | a | Explain the C syntax of structure declaration and initialization with an example | 05 | CO9 | L3 |
| | b | Explain how the structure variable passed as a parameter to a function with example | 06 | CO9 | L3 |
| | c | Explain with syntax:<br>i) fputs() ii) fgets() iii) fgetc() iv) fputc() | 04 | CO10 | L3 |
| | | **MODULE-5** | | | |
| 3 | a | Give advantages and disadvantages of pointers in C. Write a program in C to find the sum ,mean and standard deviation of all elements of array using pointer technology | 10 | CO10 | L3 |
| | b | Explain any five preprocessor directives in C | 05 | CO10 | L3 |
| | | **OR** | | | |
| 4 | a | Define pointer. Explain with an examples with declaration and Initialization of a pointer variable | 05 | CO10 | L3 |
| | b | Write a C program to swap two numbers using call by pointers(address) method | 05 | CO10 | L3 |

| | | | | | |
|---|---|---|---|---|---|
| | c | Define file. Explain all file operations with syntax and example | 05 | CO10 | L3 |

## b. Assignment – 3

Note: A distinct assignment to be assigned to each student.

| Model Assignment Questions | | | | | | | |
|---|---|---|---|---|---|---|---|
| Crs Code: | 18CPS13 | Sem: | 1 | Marks: | 5 / 10 | Time: | 90 – 120 minutes |
| Course: | C Programming for Problem Solving | | | | | | |
| Note: Each student to answer 2-3 assignments. Each assignment carries equal mark. | | | | | | | |

| SNo | USN | Assignment Description | Marks | CO | Level |
|---|---|---|---|---|---|
| 1 | | What is Structured datatype? Explain | | CO9 | L3 |
| 2 | | Explain the concept of array of structures, with a suitable C program | | CO9 | L3 |
| 3 | | 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 | | CO9 | L3 |
| 4 | | Explain structure within structure with an example | | CO9 | L3 |
| 5 | | What is a pointer? Write a C program to find the sum and mean of all elements in an array using pointers | | CO10 | L3 |
| 6 | | Write a C program to swap two numbers using call by pointer method | | CO10 | L3 |
| 7 | | Explain how pointers and arrays are related with example | | CO10 | L3 |
| 8 | | What is a file? Explain fopen and fclose functions | | CO10 | L3 |
| 9 | | Explain fgets and fputs functions | | CO10 | L3 |
| 10 | | Write a C program to copy one file to another file without using built in function | | CO10 | L3 |

# F. EXAM PREPARATION

## 1. University Model Question Paper

| Course: | C Programming for Problem Solving | | | | | Month / Year | May /2018 |
|---|---|---|---|---|---|---|---|
| Crs Code: | 18CPS13 | Sem: | 1 | Marks: | 100 | Time: | 180 minutes |

| - | Note | Answer all FIVE full questions. All questions carry equal marks. | Marks | CO | Level |
|---|---|---|---|---|---|
| 1 | a | Explain the components required to process the data in a computer | 04 | CO1 | L1 |
| | b | What is the need of network topologies. Explain the following network topologies i) Bus topology ii) star topology iii) ring topology | 06 | CO1 | L1 |
| | c | Define C tokens. List and explain different C tokens | 06 | CO2 | L2 |
| | d | What is an Identifier? Give any 5 rules that are to be followed, while declaring a variable | 04 | CO2 | L2 |
| | | **OR** | | | |
| - | a | Explain the categories of hardware devices | 04 | CO1 | L1 |
| | b | List all the operators supported in C. Explain relational, logical and bitwise operators | 06 | CO2 | L2 |
| | c | Write a C program to find the area and perimeter of a rectangle | 05 | CO2 | L2 |
| | d | Convert the following mathematical expressions into C equivalent:<br>i) area= $\sqrt{s(s-a)(s-b)(s-c)}$<br>ii) x= -b + $\sqrt{b2-4ac}$ /2a | 05 | CO2 | L2 |
| | | | | | |
| 2 | a | Explain formatted input output statements in C with syntax and example. | 04 | CO3 | L2 |
| | b | What is two-way selection statement? Explain if, if-else, nested if-else and cascaded if-else with syntax and examples | 08 | CO4 | L2 |
| | c | List the types of loops. Explain the working of any one type of loop with syntax and example | 05 | CO4 | L2 |
| | d | Develop a C program to read a year as an input and find whether it is leap year or not | 03 | CO4 | L2 |
| | | **OR** | | | |

| | | | | | |
|---|---|---|---|---|---|
| | a | Write the guidelines to use printf() function in c language | 03 | CO3 | L2 |
| | b | Explain SWITCH statement, with syntax and example | 06 | CO4 | L2 |
| | c | Write a program to find the reverse of a number and check whether it is a palindrome or not | 06 | CO4 | L2 |
| | d | Distinguish between the following:<br>i) goto and if ii) break and continue | 05 | CO4 | L2 |
| | | | | | |
| 3 | a | What is an ARRAY? Explain the different ways of initializing an array with example | 04 | CO5 | L2 |
| | b | Write a C program to read N integers into an array A and to<br>i)find the sum of odd numbers ii) find the sum of even numbers iii) find the average of all numbers<br>Output the results computed with appropriate headings | 06 | CO5 | L3 |
| | c | Write a C program to concatenate two strings without using built in function strcat() | 05 | CO6 | L3 |
| | d | Write a C program to search a name in a list of names using binary searching technique | 05 | CO6 | L3 |
| | | **OR** | | | |
| | a | Write the syntax for declaring two-dimensional array and initialize the same with suitable example | 04 | CO5 | L2 |
| | b | Explain any four string manipulation library functions with example. | 06 | CO6 | L2 |
| | c | Write a C Program to sort the given array elements in ascending order by Bubble sort technique | 05 | CO6 | L3 |
| | d | Write a C Program to search a key element in an array using linear search technique | 05 | CO6 | L3 |
| | | | | | |
| 4 | a | What is function? Explain the declaration and initialization of single dimensional array with example | 04 | CO7 | L2 |
| | b | What are actual parameters and formal parameters? Illustrate with example | 04 | CO7 | L2 |
| | c | What is Recursion? Write a C program to compute the factorial of a given number 'n' using recursion. | 06 | C08 | L3 |
| | d | Write a C program to compute polynomial coefficient $^{n}C_{r}$ using recursion | 06 | CO8 | L3 |
| | | **OR** | | | |
| | a | Explain function call, function definition and function prototype with example to each | 06 | CO7 | L2 |
| | b | Write a C program to check a number is a prime number or not using recursion | 06 | CO8 | L3 |
| | c | Write a C program to find the Fibonacci series using recursion | 04 | CO8 | L3 |
| | d | Explain the two categories of argument passing techniques, with example | 04 | CO7 | L2 |
| | | | | | |
| 5 | a | Define structure? Write a C program to store and print name, USN, subject and IA marks of students using structure | 06 | CO9 | L3 |
| | b | Explain structure declaration and initialization with an example | 04 | CO9 | L2 |
| | c | Write a C program to swap two numbers using call by pointers(address) method | 05 | CO10 | L3 |
| | d | Explain any five preprocessor directives in C | 05 | CO10 | L2 |
| | | **OR** | | | |
| | a | Write a note on the following with an example for each:<br>I) Arrays of structures ii) arrays within structures iii) structures within structures | 06 | CO9 | L3 |
| | b | What is a pointer? Explain with an examples with declaration and Initialization of a pointer variable | 04 | CO10 | L3 |
| | c | Write a C program to find the sum and mean and standard deviation of all elements in an array using pointers | 06 | C010 | L3 |
| | d | Give the advantages and disadvantages of pointer datatype | 04 | CO10 | L2 |

## 2. SEE Important Questions

| Course: | C Programming for Problem Solving | | | | | Month / Year | May /2018 | |
|---|---|---|---|---|---|---|---|---|
| Crs Code: | 18CPS13 | Sem: | 1 | Marks: | 100 | Time: | 180 minutes | |
| | **Note** | Answer all FIVE full questions. All questions carry equal marks. | | | | - | - | |
| Module | Qno. | Important Question | | | | **Marks** | **CO** | **Year** |
| 1 | 1 | Explain the categories of hardware devices | | | | 10 | CO1 | 2010 |
| | 2 | Explain the components required to process the data in a computer | | | | 07 | CO1 | 2010 |
| | 3 | Mention the various steps associated with information processing cycle and explain them | | | | 08 | CO1 | 2011 |
| | 4 | Mention the different storage devices and explain one o f them | | | | 04 | CO1 | 2011 |
| | 5 | What is the need of network topologies. Explain the following network topologies i) Bus topology ii) star topology iii) ring topology | | | | 08 | CO1 | 2010 |
| | 6 | Write basic structure of C program and explain its different sections | | | | 08 | Co2 | 2018 |
| | 7 | Define C tokens. List and explain different C tokens | | | | 10 | CO2 | 2015 |
| | 8 | Explain the following operators in C language:<br>i) Relational ii) Logical iii) Conditional | | | | 08 | CO2 | 2016 |
| | 9 | Write a C program to find the area and perimeter of a rectangle | | | | 06 | CO2 | 2016 |
| | 10 | Write a note on different types of Type conversions, with an example for each | | | | 08 | CO2 | 2017 |
| | 11 | List all the operators supported in C. Explain relational, logical and bitwise operators | | | | 08 | CO2 | 2018 |
| | 12 | Write a C program to find area of a triangle,when we know the lengths of all three of its sides | | | | 08 | CO2 | 2018 |
| | 13 | What is an Identifier? Give any 5 rules that are to be followed, while declaring a variable | | | | 04 | CO2 | 2015 |
| | | | | | | | | |
| 2 | 1 | Explain scanf() and printf() function in C language with syntax and examples | | | | 08 | CO3 | 2016 |
| | 2 | Explain different types of input and output functions in C with syntax and examples | | | | 06 | CO3 | 2017 |
| | 3 | Write the syntax of nested if..else statement and explain its working | | | | 08 | CO4 | 2018 |
| | 4 | What is two-way selection statement? Explain if, if-else,nested if-else and cascaded if-else with syntax and examples | | | | 10 | CO4 | 2015 |
| | 5 | Explain switch statement with an example | | | | 06 | CO4 | 2015 |
| | 6 | List the types of loops. Explain the working of any one type of loop with syntax and example | | | | 08 | CO4 | 2016 |
| | 7 | Write a program to find the reverse of a number and check whether it is a palindrome or not | | | | 06 | CO4 | 2016 |
| | 8 | Distinguish between the following:<br>i) goto and if ii) break and continue | | | | 04 | CO4 | 2018 |
| | 9 | Write a C program to find the roots of quadratic equation | | | | 10 | CO4 | 2018 |
| | 10 | Develop a C program to read a year as an input and find whether it is leap year or not | | | | 04 | CO4 | 2017 |
| | | | | | | | | |
| 3 | 1 | Define an array. Write the syntax for declaring two-dimensional array and initialize the same with suitable example | | | | 10 | CO5 | 2018 |
| | 2 | What is an array? How is a single dimensional array is declared and initialized. | | | | 06 | CO5 | 2015 |
| | 3 | Write a C program to read N integers into an array A and to<br>i)find the sum of odd numbers ii) find the sum of even numbers iii) find the average of all numbers Output the results computed with appropriate headings | | | | 06 | Co5 | 2015 |
| | 4 | Write a C program to search a name in a list of names using binary searching technique | | | | 08 | Co6 | 2016 |
| | 5 | Explain any four string manipulation library functions with example. | | | | 08 | CO6 | 2017 |

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| | 6 | 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 | CO5 | 2016 |
| | 7 | Write a C program to concatenate two strings without using built in function strcat() | 05 | CO6 | 2015 |
| | | | | | |
| 4 | 1 | What is function? Explain the declaration and initialization of single dimensional array with example | 05 | CO7 | 2015 |
| | 2 | Explain the types of function based on parameters | 05 | CO7 | 2015 |
| | 3 | Explain the two categories of argument passing techniques,with example | 06 | CO7 | 2015 |
| | 4 | Explain function call, function definition and function prototype with example to each | 06 | CO7 | 2015 |
| | 5 | What is Recursion? Write a C program to compute the factorial of a given number 'n' using recursion. | 08 | CO8 | 2007 |
| | 6 | Write a C program to check a number is a prime number or not using recursion | 06 | CO8 | 2015 |
| | 7 | Write a C program to compute polynomial co-efficient ${}^{n}c_{r}$ using recursion | 04 | CO8 | 2016 |
| | 8 | Write a C program to compute the factorial of a given number 'n' using recursion | 08 | CO8 | 2018 |
| | | | | | |
| 5 | 1 | What is structure? Explain the C syntax of structure declaration with example | 04 | CO9 | 2016 |
| | 2 | Explain structure within structure with an example | 08 | CO9 | 2018 |
| | 3 | Write a C program to pass structure variable as function argument | 07 | CO9 | 2015 |
| | 4 | Write a C program to store and print name, USN, subject and IA marks of student using structure | 08 | CO9 | 2015 |
| | 5 | 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 | CO9 | 2017 |
| | 6 | What is pointer? Explain how the pointer is declared and initializes | 04 | CO10 | 2016 |
| | 7 | Explain the array of pointers with example | 04 | CO10 | 2016 |
| | 8 | Write a C program to swap two numbers using call by pointers(address) method | 06 | CO10 | 2016 |
| | 9 | What is file? Explain fopen and fclose functions | 05 | CO10 | 2016 |
| | 10 | Explain any four preprocessor directives in C with example for each | 08 | CO10 | 2018 |