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**INSTITUTE OF AERONAUTICAL ENGINEERING****(Autonomous)****Dundigal, Hyderabad - 500 043****MODEL QUESTION PAPER-II**

B.Tech I Semester End Examinations, April - 2020

**Regulations: IARE - R18****PROGRAMMING FOR PROBLEM SOLVING****(Common to CSE / IT / ECE / EEE / ME)****Time:3hours****Max. Marks: 70**

Answer ONE Question from each Module

All Questions Carry Equal Marks

All parts of the question must be answered in one place only

**MODULE - I**

- 1
  - a) What are different simple and derived Data Types used in C? Explain with example. [7M]
  - b) What are different types of expressions used in C? Write a C program to convert centigrade Temperature to Fahrenheit [7M]
- 2
  - a) Explain about operator precedence and associativity among different operators used in C. [7M]
  - b) What are different types of escape sequences and I/O statements used in C? Explain with syntax and example [7M]

**MODULE - II**

- 3
  - a) List out various conditional, unconditional and nested control statements used in C with syntax and example [7M]
  - b) Write a C program to find the roots of a quadratic equation by testing all necessary and sufficient Conditions [7M]
- 4
  - a) Define string. What are different types of string handling functions used in C with example [7M]
  - b) Write a C program to concatenate two strings without using built-in functions. [7M]

**MODULE - III**

- 5
  - a) Explain about i) storage classes used in C and ii) pointers for inter-function communication [7M]
  - b) Write a C program to illustrate functions call by value and call by reference [7M]
- 6
  - a) Explain about i) passing an array to a function by using pointers and ii) pointers to void and to functions [7M]
  - b) Write a C program to demonstrate towers of Hanoi problem by using recursion principle. [7M]

#### **MODULE - IV**

- 7 a) Compare and contrast between structure and union and explain about dynamic memory allocation functions used in C with syntax [7M]  
b) Write a C program to store information of an employee in nested structure and display employee details and his salary details [7M]
- 8 a) Explain about i) library functions used in C and ii) accessing of members of structure [7M]  
b) Define a structure called Cricket that will have player name, team name, and batting average of the player. Using Cricket, declare an array player with 10 elements. Write a program to read the information about all the 10 players and print a team wise list containing names of players with their batting average [7M]

#### **MODULE - V**

- 9 a) What are different types of file access permission and character I/O functions used in C? Explain with syntax and example [7M]  
b) Write a program that opens an existing text file and copies it to a new text file with all lowercase letters changed to capital letters and all other characters unchanged [7M]
- 10 a) Explain about i) File status functions and ii) File positioning functions [7M]  
b) Write a C program to maintain details of student using array of structures to a file via fwrite(). The program must read the array from file and display on the screen [7M]

## COURSE OBJECTIVES:

The course should enable the students to:

I	Learn adequate knowledge by problem solving techniques.
II	Understand programming skills using the fundamentals and basics of C Language.
III	Improve problem solving skills using arrays, strings, and functions.
IV	Understand the dynamics of memory by pointers.
V	Study files creation process with access permissions.

## COURSE OUTCOMES (COs):

CO 1	Describe the concept of computer system, analyze a given problem, develop an algorithm, fundamental programming constructs, identify data representation formats, describe operators and their precedence, associativity.
CO 2	Understand branching and loop statements.
CO 3	Describe the concept of homogeneous derived data types, strings and functions.
CO 4	Understand pointers and heterogeneous data types.
CO 5	Describe the concept of file system.

## COURSE LEARNING OUTCOMES (CLOs):

ACSB01.01	Identify and understand the working of key components of a computer system.
ACSB01.02	Analyze a given problem and develop an algorithm to solve the problem.
ACSB01.03	Describe the fundamental programming constructs and articulate how they are used to develop a program with a desired runtime execution flow.
ACSB01.04	Gain knowledge to identify appropriate C language constructs to write basic programs.
ACSB01.05	Identify the right data representation formats based on the requirements of the problem.
ACSB01.06	Describe the operators, their precedence and associativity while evaluating expressions in program statements.
ACSB01.07	Understand branching statements, loop statements and use them in problem solving.
ACSB01.08	Learn homogeneous derived data types and use them to solve statistical problems.
ACSB01.09	Identify the right string function to write string programs.
ACSB01.10	Understand procedural oriented programming using functions.
ACSB01.11	Understand how recursion works and write programs using recursion to solve problems.
ACSB01.12	Differentiate call by value and call by reference parameter passing mechanisms.
ACSB01.13	Understand storage classes and preprocessor directives for programming
ACSB01.14	Understand pointers conceptually and apply them in C programs.
ACSB01.15	Distinguish homogeneous and heterogeneous data types and apply them in solving data processing applications.
ACSB01.16	Explain the concept of file system for handling data storage and apply it for solving problems
ACSB01.17	Differentiate text files and binary files and write the simple C programs using file handling functions.
ACSB01.18	Apply the concepts to solve real-time applications using the features of C language.
ACSB01.19	Gain knowledge to identify appropriate searching and sorting techniques by calculating time complexity for problem solving.
ACSB01.20	Possess the knowledge and skills for employability and to succeed in national and international level competitive examinations.

## MAPPING OF SEMESTER END EXAMINATION TO COURSE LEARNING OUTCOMES:

SEE Question No		Course Learning Outcomes		Course Outcomes	Blooms Taxonomy Level
1	a	ACSB01.01	Identify and understand the working of key components of a computer system.	CO 1	Understand
	b	ACSB01.02	Analyze a given problem and develop an algorithm to solve the problem.	CO 1	Understand
2	a	ACSB01.06	Describe the operators, their precedence and associativity while evaluating expressions in program statements.	CO 1	Understand
	b	ACSB01.06	Describe the operators, their precedence and associativity while evaluating expressions in program statements.	CO 1	Understand
3	a	ACSB01.07	Understand branching statements, loop statements and use them in problem solving.	CO 2	Understand
	b	ACSB01.08	Learn homogenous derived data types and use them to solve statistical problems.	CO 2	Remember
4	a	ACSB01.08	Learn homogenous derived data types and use them to solve statistical problems.	CO 2	Understand
	b	ACSB01.09	Identify the right string function to write string programs.	CO 2	Understand
5	a	ACSB01.14	Understand pointers conceptually and apply them in C programs.	CO 3	Understand
	b	ACSB01.10	Understand procedural oriented programming using functions.	CO 3	Understand
6	a	ACSB01.08	Learn homogenous derived data types and use them to solve statistical problems.	CO 3	Understand
	b	ACSB01.14	Understand pointers conceptually and apply them in C programs.	CO 3	Understand
7	a	ACSB01.15	Distinguish homogenous and heterogeneous data types and apply them in solving data processing applications.	CO 4	Understand
	b	ACSB01.15	Distinguish homogenous and heterogeneous data types and apply them in solving data processing applications.	CO 4	Understand
8	a	ACSB01.15	Distinguish homogenous and heterogeneous data types and apply them in solving data processing applications.	CO 4	Understand
	b	ACSB01.15	Distinguish homogenous and heterogeneous data types and apply them in solving data processing applications.	CO 4	Understand
9	a	ACSB01.16	Explain the concept of file system for handling data storage and apply it for solving problems	CO 5	Understand
	b	ACSB01.17	Differentiate text files and binary files and write the simple C programs using file handling functions.	CO 5	Understand
10	a	ACSB01.19	Differentiate call by value and call by reference parameter passing mechanisms.	CO 5	Understand
	b	ACSB01.16	Explain the concept of file system for handling data storage and apply it for solving problems	CO 5	Understand

Signature of Course Coordinator

HOD, IT