Roll No. | | | | | | | | |

Mid Semester Examination 2024

Name of the Program:B. Tech. *Semester*: I

Name of the Course: CSE *Course Code*: TCS 101

Paper Name:FUNDAMENTALS OF COMPUTERS & INTRODUCTION TO PROGRAMMING

Time: 1 Hour and 30 minutes **Max. Marks: 50**

Note:

(i) Answer all five questions by selecting any one of the sub-sections.

(ii) Each questioncarries10 marks.

Q.1	**(10 Marks)**	
a)	**"This generation of computers useshigh level languages, much sophisticated hardware & have an ability to perform intelligent computing"**. Which generation is being referred to & also compare this generation with its previous generation in terms of its performance, chip integration, advantages & disadvantages.	**CO-1**
	OR	
b)	Discuss the terms: Data, Information, Instruction and Program.Describe the stored programming concept in a computer system with a neat diagram.	
Q.2	**(10 Marks)**	
a)	Discuss the significance of memory hierarchy with a neat sketch highlighting the different memories with respect to their capacity, performance, access time & cost per bit.	
	OR	
b)	i) Explain the importance of operating system & it's most significant functions for a computer system. ii) Manish is a programmer and stores approximately1020 MB of data per day to a cloud storage. Calculate the amount of data stored by him in a period of 6 dayson the cloud, when expressed in GB's. (Assume 1MB= 1000000 bytes for calculation)	**CO-1**
Q.3	**(10Marks)**	
a)	i) Draw a neat flowchart to read a distance in centimeters from the keyboard and then display by converting it into kilometers, meters and centimeters. *(Ex. 157250 cms= 1 km , 572 metres and 50 cms)* ii) List the characteristics of a good algorithm. Write an algorithm to determine the year given as input is a leap year or not.	**CO-2,3**
	OR	
b)	Bhogilal is a fruit seller, he gives discount to his customers on buying of mangoes as follows: If the customer is known to him for more than 5 years, then 9.5% on the bill amount. If the customer is known to him for more than 7 years, then 12.5% on the bill amount. If the customer is known to him for more than 10 years, then 15% on the bill amount. No discount if the customer is known to him for less than 5 years. However, if the bill amount exceeds Rs.1000 then customer gets additional 5% discount onthe final bill amount. Model the above situation using a flowchart by reading the number of Kgs of mangoes, the rate per Kg and N number of years known as input. Display the discounted amountand the final bill amount.	
Q.4	**(10Marks)**	
a)	i) In an experiment performed,three reading R1,R2, and R3 are recorded. Write a C program to compute the average of least two readings and display it to the console. *(Ex. Say R1=10.9, R2=15.6 and R3=9.4, then average is (R1+R3)/2=10.15)*	**CO-2,4**

	ii) Assume an8-bit computer with size of **int** datatype as one byte. Show the range of numbers (from minimum to maximum range) that can be stored if a variable is declared as **signed** and **unsignedint** type.	
	OR	
b)	List and explain the working of logical operators with a fragment of C code. Implement a C program to find the biggest of three numbers using a ternary operator. Read the numbers as input from the keyboard.	
Q.5	**(10Marks)**	
a)	i)Draw a neat diagram with brief explanation of various stages in the life cycle of a C program. Outline the tasks performed during the pre-processing phase of compilation. ii)Draw a flowchart to compute the following series up to N terms. $1^2 - 3^2 + 5^2 - 7^2 + 9^2 - \ldots\ldots\ldots\ldots\ldots\ldots N^2$	
	OR	

b)	i) Explain the type of conversion performed by the compiler and the value of **R** in the following fragment of C code. Also, demonstrate how to retain the fractional part after division by performing an appropriate type conversion.
	void main(){
	int Num=110, R;
	R= Num /3;}
	
	ii) Predict the output of the following C programs. Assume all the programs are free of syntax errors. Justify your answers. Also, assume **int** data type to be of 4-bytes.
	A. #include<stdio.h>
	void main()
	{ int a, b=10;
	printf("%d",a%b);
	}
	B. #include<stdio.h>
	void main()
	{ int yy=15, b=2;
	printf("%d",(yy<<b)/2);
	}
	C. #include<stdio.h>
	void main()
	{ int p=13,q=-14,r;
	r=p++ + (++q);
	printf("%d %d",r,p);
	}
	D. #include<stdio.h>
	void main()
	{ float a=0, b=10;
	if((a+b)/2 < (a-b) && !a) ;
	printf("Always True") ;
	}
	E. #include <stdio.h>
	int main() {
	char kdc='a';
	if(100>(70 && 50) && 50 != !(40 ||30))
	kdc='H';
	printf("%d",kdc);
	return 0;
	}
		CO-2,3 & CO-4