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TCS–101

B. TECH. (FIRST SEMESTER)

MID SEMESTER

EXAMINATION, Oct., 2023

FUNDAMENTALS OF COMPUTERS AND

INTRODUCTION TO PROGRAMMING

Time : 1½ Hours

Maximum Marks : 50

Note : (i) Answer all the questions by choosing any *one* of the sub-questions.

(ii) Each sub-question carries 10 marks.

1. (a) "This computer generation used million & billions of transistors integrated on a its single chip". Discuss the generation of computers being referred to in the statement. Also, discuss the types of applications possible & compare its

advantages/disadvantages to the generations prior to it. In which of the generations the term PC was used for the first time to refer a Computer System ?

(CO1)

OR

(b) Draw a neat diagram of memory hierarchy highlighting the significant memories and discuss by considering the parameters capacity, access time, performance, and cost per bit. (CO1)

2. (a) "He was the pioneer in introducing the idea of stored programming model to the world." Explain the model being referred to with appropriate illustrations. Briefly explain the working of any three input and output devices used in a computer system.

(CO1)

OR

(b) (i) "The peripheral devices of a computer system requires a software to be functional." Elaborate on the category

of software been referred to in this statement with an example. BIOS uses which type of Software ?   (CO1)

(ii) Amar wants to record an event of 5 hours as MP4 video files. Calculate the amount of data expressed in PB ? Assuming the gadget can record 0.5 TB per minute of data.   (CO1)

3. (a) (i) List at least *five* functions of an operating system.   (CO1)

(ii) Briefly discuss types of Computer Networks with an example for each.

(CO1)

OR

(b) (i) How does C compiler perform the explicit and implicit conversion in C ? Discuss with an example for each.

(CO1)

(ii) Explain AND, OR and Complement operation using bitwise operators in C with an illustration for each.   (CO2)

4. (a) (i) Design an algorithm to read time in Seconds and convert it into Hours, Minutes, and Seconds. Read the Seconds from the keyboard.

Sample Input :

Enter time in Seconds-7267

Sample Output :

Hour-2

Minute-1

Seconds-7

(ii) Draw a flowchart to find and display whether the year accepted from the user is a leap year or not. Ensure constraint on the year i.e. year $>=$ 1900 and less than $<=9999$.

OR

(b) (i) Draw a flowchart to generate the bill based on the following assumptions. Boghilal is a fruit seller he sells mangoes @rate of ₹ 60 per K.G. He

gives discount to the known customers as follows :

(1) If the customer is known to him for more than 5 years and less than 10 years then he gives a discount of 10% on the final amount.

(2) If the customer is known to him for more than 10 years and less than 15 years then he gives a discount of 15% on the final amount.

(3) If the customer is known to him for more than 15 years than he gives a discount of 20% on the final amount.

(4) Otherwise no discount to the customer known to him for 0 to 5 years.

Read the quantities of mangoes and number of years the customer is known as input.

Sample I/P & O/P :

Assume the customer buys 20 kgs of mangoes then the following bill is generated based on the number of years the customer is known to him :

(1)   If customer is known for >5 and <10 years :

$$60 *20\ 1200-120 = 1080$$

Final Bill Amount : ₹ 1080/-

(2)   If customer is known for >10 and <15 years :

$$60 *20 =1200 -180= 1020$$

Final Bill Amount : ₹ 1020/-

(3)   If customer is known for >15 years :

$$60 *20 =1200-240 = 960$$

Final Bill Amount : ₹ 960/-

(4)   If customer is known for 0 to 5 years :

$$60*20=1200-0=1200$$

Final Bill Amount : ₹ 1200/-

(ii) Write a C program to find the biggest of three integers accepted from the user using ternary operator and display the same to the output screen.

5. (a) With a neat sketch illustrate and explain the life cycle of a C program. (CO2/CO3)

OR

(b) (i) List the rules to declare an identifier. Identify which of the following are valid identifiers : (CO2/CO3)

ABC_, ABc9_, _ab*&_, 656_ABC90, $$ABC77

(ii) Predict the final value of x and y from the snippet of the following C code : (CO2/CO3)

int x= 10, y 5;

(i) y (x==10) && (x>y || (x++) -y) >=5) ;
    printf("x=%d y=%d", x, y) ;

(ii) x (x < 10) ? x : (y>=5) ? x++ :--y;
    printf("x=%d y=%d", x, y) ;

(iii) x (++x) - (y++) - (x- -) ;
    printf("x=%d y=%d", x, y) ;

(iv) x= x>>1 | (y<<2) ;

   y y & x;

   printf("x=%d y=%d", x, y) ;

(v) x= x^y;

   y=x^y;

   x= x^y;

   printf("x=%d y=%d", x, y);