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**Roll No. ....**

**TCS-101**

**B. TECH. (FIRST SEMESTER)  
MID SEMESTER EXAMINATION, 2021-22**

**(All Braches)**

**FUNDAMENTALS OF COMPUTERS AND  
INTRODUCTION TO 'C' PROGRAMMING**

**Time : 1 : 30 Hours**

**Maximum Marks : 50**

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

(ii) Each question carries 10 marks.

1. (a) Discuss the generations of computers based on Ultra Large Scale Integration (ULSI) and Very Large Scale Integration (VLSI). Elaborate on types of applications possible in these generations when compared to its prior generation.

**P. T. O.**

OR

- (b) Illustrate with a neat diagram the memory hierarchy and explain it with respect to the capacity, access time, performance and cost per bit.
2. (a) Describe the Von Neuman architecture of a compute system with a neat diagram. Explain the working of any *five* input and *five* output devices used in a computer system.

OR

- (b) (i) List at least *five* differences between Read Only Memory (ROM) and Random Access Memory (RAM). Also, discuss various types of ROMs available with its applications in electronic gadgets and equipments.
- (ii) Assume Kiran wants to record a cultural program of 6 and half hours a MP3 audio files. Calculate the amount

of data expressed in TB. Assuming the gadget can record 2000 KB per minute of data.

3. (a) (i) List the functions of an operating system. Briefly discuss the types of Computer Networks with an example.
- (ii) A certain organization has its two offices separated by a distance of 50 kms apart. Suggest a network type to connect these offices for a smooth communication between them. Also, give reason for the same.
- (b) (i) Write a snippet of code in C to demonstrate the biggest of three numbers using the Ternary Operator.
- (ii) Explain the meaning of explicit and implicit conversion in C with an example for each.

4. (a) (i) Design an algorithm to compute and display the final value of the following series :

$$1 + 3^2 + 5^2 + 7^2 + \dots N^2$$

(where  $N > 0$ )

Read  $N$  from the keyboard with a constraint that the algorithm does not accept the negative values of  $N$ .

- (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  $\geq 1900$  and less than  $\leq 9999$ .

OR

- (b) (i) Draw a flowchart to generate the Electricity bill based on the following assumptions. Base charge on consumption of Electricity (in kWh) per month is charged at flat ₹ 5 per unit and then subsequently a

surcharge is levied on the consumption as per the below rules :

- (A) Electricity consumption upto 250 units has no surcharge.
- (B) Electricity consumption greater than 250 units upto 500 units have a surcharge of ₹ 1.50 per unit.
- (C) Electricity consumption greater than 500 units have a surcharge of ₹ 1.70 per unit.

Read the input as number of units of electricity consumed per month from the user.

e. g.

For Electricity consumption of 800 units the following bill is generated :

For 800 units : ₹  $5 \times 800 = ₹ 4,000$

Surcharge for 0-250 units is NIL

Surcharge for 251-500 units is  
₹  $1.5 \times 250 = ₹ 375$

Surcharge for 501-800 units is  
 $\text{₹ } 1.7 * 300 = \text{₹ } 510$

Total bill :  $\text{₹ } 4,000 + \text{₹ } 375 + \text{₹ } 510 =$   
 $\text{₹ } 4,885.$

- (ii) Design an algorithm to find and display the factorial of a positive number N accepted from the user with a constraint that  $N > 0$  and  $N \leq 20$ .

5. (a) Illustrate the life cycle of a C program with a neat diagram.

OR

- (b) (i) Enumerate the rules to declare an identifier. Identify which of the following are valid identifiers :

Val\_21, ? firm Var, 123xyz, Beta 32,  
 \_432 jack

- (ii) Predict the final value of x and y :

`int x = 8, y = -3;`

`x = (y++) - (--x);`

`y = (x--) - (y*3) + 30;`

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