TCS–101

B. TECH. (CSE)
(FIRST SEMESTER)
MID SEMESTER
EXAMINATION, Jan., 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) Discuss the generations of computers taking into account the parameters such as size, speed, performance and application areas when comparing with its prior generations.

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OR

(b) Draw and explain with a neat diagram the memory hierarchy by considering the factors such as the capacity, access time, performance and cost per bit.

2. (a) Describe the Von Neumann Architecture of a computer system with a neat diagram. Briefly discuss the working of any *two* input and output devices used in a computer system.

OR

(b) (i) Elaborate on the categories of software supported by a computer system with examples for each. Anit-virus, Data Backup, File Management Software, Compression Tool are which category of software ?

(ii) A recording studio generates a data of 72 TB of data in 8 hours per day. Calculate the rate of recording data and express in GB/sec ?

Assume 1 kB = 1000 bytes for calculation.

3. (a) What are C tokens ? Explain AND, OR and Complement operation using bitwise operators with an illustration for each.

OR

(b) Discuss explicit and implicit type conversion. In the given snippet of code below, explain the type of conversion.

float var = 11.0/3;

printf("var =%0.2f", var);

4 (a) List the characteristics of a good algorithm. Write an algorithm to find and display whether the year accepted from the user is a leap year or not. Ensure a constraint : year > = 1900 and less than < = 9999.

OR

(b) Bogilal likes to buy N cartons of mangoes from a fruit seller. If the fruit seller had Q Kgs of mangoes and each carton can hold 50 Kgs of mangoes, Cost per Kgs is ₹ 60, then find the total amount paid by

Bogilal in Rupees to the fruit seller and also the cost of inventory (balance managoes worth left) with the fruitseller. Draw a flowchart for the same.

5. (a) With a neat diagram elaborate on the life cycle of a C program.

OR

(b) Give the valid C expression for the following sub-parts from (i) to (v) :

(i) $A = \dfrac{6x + 2y}{a - b}$

(ii) $B = \sqrt{s(s - a)(s - b)(s - c)}$

(iii) $Desc = \sqrt{b^2 - 4ac}$

(iv) $x^{35} + y^{15}$

(v) $C = \log(x + y)$

(vi) Predict the final values of x and y :

int M = –7, N = – 2;
M = (--N) – (M--);
N = (3 * M--) + (N/3) + 10;
printf("M=%d M=%d", M, N);

TCS–101								250