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Question Paper Code : 30036

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2026.

First Semester

Computer Science and Engineering

CS25C03 — ESSENTIALS OF COMPUTING -

(Common to : Computer Science and Design/Computer Science and Engineering (Artificial Intelligence and Machine Learning)/Computer Science and Engineering (Cyber Security)/Computer Science and Engineering (Data Science)/Computer Science and Engineering (IoT)/Computer and Communication Engineering/Artificial Intelligence and Data Science/Computer Science and Business Systems/Information Technology)

(Regulations 2025)

Time : 3 hours

Maximum : 100 marks

CO – Course Outcomes

CO1	Describe the basic components and functioning of computers, number systems and data representation.
CO2	Apply computational thinking and problem-solving techniques to design simple algorithms for real-world problems.
CO3	Design and represent solutions using flowcharts, pseudocode and basic visual programming tools.
CO4	Demonstrate the ability to independently learn new computing tools and practices essential for life-long learning.

BL – Bloom's Taxonomy Levels

(L1-Remember, L2-Understand, L3-Apply, L4-Analyze, L5-Evaluate, L6-Create)

Answer ALL questions.

PART – A (Total Marks = 40)**[Q. No. 1 to Q. No. 10 ; $10 \times 1 = 10$ Marks (Multiple Choice Questions)]****Q. No. 11 to Q. No. 20; $10 \times 3 = 30$ Marks]**

Q.No.	Questions	Marks	CO	BL
1.	The basic functional units of a computer include (A) Input, Output, Memory ALU (B) CPU only (C) Software only (D) Internet	1	1	1

2.	Which generation of computers used transistors? (A) First (B) Second (C) Third (D) Fourth	1	1	1
3.	Which of the following is an example of an operating system? (A) MS Word (B) Linux (C) Excel (D) Chrome	1	1	1
4.	The binary equivalent of decimal number 10 is: (A) 1000 (B) 1010 (C) 1100 (D) 1110	1	2	1
5.	Boolean algebra deals with: (A) Numbers (B) Logic values (C) Text (D) Images	1	2	1
6.	Which of the following is a control structure? (A) Loop (B) Variable (C) Constant (D) Operator	1	3	1
7.	Algorithm should be: (A) Ambiguous (B) Finite (C) Complex (D) Long	1	3	1
8.	Which programming paradigm focuses on objects? (A) Procedural (B) Object-Oriented (C) Functional (D) Logical	1	4	1
9.	Scratch is mainly used for: (A) System programming (B) Visual programming (C) Web hosting (D) Database design	1	5	2

10.	App development involves: (A) Only coding (B) Only testing (C) Design, coding, testing (D) Only debugging	1	5	2
11.	Explain the basic components of a computer system with a neat diagram.	3	1	1
12.	Write short notes on the history and generations of computers.	3	1	1
13.	Differentiate between system software and application software with examples.	3	2	1
14.	Convert the following: (a) $(25)_{10}$ to Binary (b) $(1011)_2$ to Decimal	3	2	2
15.	Explain the basic logic gates (AND, OR, NOT) with truth tables.	3	3	1
16.	Define computational thinking. Explain any two components.	3	3	2
17.	Write an algorithm and flowchart to find the sum of two numbers.	3	4	2
18.	Explain different types of loops in programming with examples.	3	4	3
19.	List and explain any three features of Scratch programming.	3	5	1
20.	Write short notes on app development process and its stages.	3	5	2

PART – B (5 × 12 = 60 marks)

Q.No.	Questions	Marks	CO	BL
21.	(a) Classify the devices (5 computers, 2 printers, 1 scanner, 1 router) into input, output, processing, or storage units, draw the computer system architecture diagram, and explain their interaction in a real-time office setup.	12	1	2
	OR			
	(b) Using the marks 78, 85, 92, 67, and 88, calculate average, maximum, and minimum using spreadsheet formulas, represent them using a bar chart and explain their role in decision-making.	12	1	3

22.	(a)	Convert $(45)_{10}$ to binary, $(110101)_2$ to decimal, $(7A)_{16}$ to decimal, and $(255)_{10}$ to hexadecimal, explaining each step.	12	2	3
	OR				
	(b)	Simplify the Boolean expression $F = (A + B')(A' + C)$, draw its logic circuit and construct the truth table.	12	2	3
23.	(a)	Write an algorithm and draw a flowchart to find the largest among 25, 47, and 19 and to count even numbers from 1 to 50.	12	3	4
	OR				
	(b)	Sort the array [34, 12, 56, 23, 89, 10] using Bubble Sort showing all passes, perform Linear Search for 23, and compare their time complexities.	12	3	4
24.	(a)	Write pseudocode to compute the sum of first 10 natural numbers using both looping and recursion, and compare their efficiency.	12	4	2
	OR				
	(b)	Identify syntax, runtime, and logical errors in a program with missing semicolon, wrong variable name, and infinite loop, explain debugging techniques, and provide the corrected version.	12	4	2
25.	(a)	Design a Scratch program to move a sprite 100 steps repeated 5 times, include a condition to change color on touching edge and explain the blocks used.	12	5	3
	OR				
	(b)	Design a student attendance mobile app by identifying inputs, outputs, processing steps, developing an algorithm/workflow, and explaining testing and debugging methods.	12	5	3