

SCHOOL OF COMPUTER SCIENCE AND ENGINEERING
CONTINUOUS ASSESSMENT TEST - II
FALL SEMESTER 2025-2026

Programme Name & Branch : B.Tech – Computer Science and Engineering-Artificial Intelligence and Data Engineering/ Cyber Security
Course Code and Course Name : BACSE103 & Computation Structures
Faculty Name(s) : Dr.MALASERENE I, Dr. KRISHNAMOORTHY N, Dr.DEEPA M
Class Number(s) : Dr. BALAJI E
Date of Examination : VL2025260105815, 817, 824, 826
Exam Duration : 10.10.2025
Exam Duration : 90 minutes
Maximum Marks: 50

General instruction(s):

- Answer All Questions
- M - Max mark; CO – Course Outcome; BL – Blooms Taxonomy Level (1 – Remember, 2 – Understand, 3 – Apply, 4 – Analyse, 5 – Evaluate, 6 – Create)
- CO2: To analyze and design sequential circuits utilizing various types of flip-flops
- CO3: To analyze different instruction formats, addressing modes and validate efficient algorithms for fixed-point arithmetic operations

Q. No	Question	Module	Marks	CO	BL
1.	Analyse the given Clocked Sequential circuit and present the state equations, state table and state diagram. (a) State Equations. (2 Marks) (b) List the state table for the sequential circuit. (4 Marks) (c) Draw the corresponding state diagram (4 Marks)	2	10	2	BL3
2.	Construct the Asynchronous Mod 9 Counter to count the 9 states from 8 to 0 numbers in the reverse order using T Flip-flop and also draw the timing wave form.	2	10	2	BL4

3.	a) Applying the restoring division method for the following unsigned number 13/4. b) An instruction is stored in main memory at address location 1000, and its corresponding address field is located at address 1001. The value contained in the address field is 600. At the time of execution, the processor register contents are as follows: R1= 900, PC=400 and BR=700 <table><tr><td>200</td><td>Value</td></tr><tr><td>600</td><td>700</td></tr><tr><td>601</td><td>800</td></tr><tr><td>602</td><td>900</td></tr><tr><td>700</td><td>950</td></tr><tr><td>800</td><td>990</td></tr><tr><td>899</td><td>980</td></tr><tr><td>900</td><td>1000</td></tr><tr><td>901</td><td>1050</td></tr></table> Based on the above information: a) Determine the effective address for the instruction under each of the following addressing modes. b) Determine the contents of the Accumulator (AC) for the provided data, assuming the instruction uses the following addressing mode. 1. Immediate addressing mode 2. Direct addressing mode 3. Indirect addressing mode 4. Register addressing mode 5. Register indirect addressing mode	200	Value	600	700	601	800	602	900	700	950	800	990	899	980	900	1000	901	1050	3	5	3	BL3
200	Value																						
600	700																						
601	800																						
602	900																						
700	950																						
800	990																						
899	980																						
900	1000																						
901	1050																						
4.	Develop program to evaluate the arithmetic expression. $X=A*B+C*D+E-F$. (i). Using a general register computer with three address instructions. (ii). Using a general register computer with two address instructions. (iii). Using an accumulator type computer with one address instructions. (iv). Using a stack organized computer with zero-address operation instructions.	3	10	3	BL4																		
	Where A, B, C, D, E and F are memory addresses. In accordance with programming language practice, computing the expression should not change the original value of its operands.																						
5.	Multiply -25×-13 using Booth's Algorithm (assume 8-bit signed representation).	3	10	3	BL4																		