



Programme Name & Branch
Course Code and Course Name
Faculty Name(s)

:B.Tech- Information Technology
:BITTE202L -Digital Logic and Microprocessors
: Prof. Santhi.K, Prof. Nithya.S, Prof. Krishnamoorthy.N,
Prof. Suganya.D, Prof. Jenila Vincent.M
: VL2024250502972, VL2024250502974, VL2024250502959,
VL2024250502968

Class Number(s)

Date of Examination
Exam Duration

: 17-Mar-2025
: 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)
- Course Outcomes (Type the CO statements covered in this question paper. Use the CO number as per the syllabus copy)

CO2. Demonstrate the design, and analysis of various combinational logic circuits and sequential logic circuits using flip flops and logic gates.

CO3. Deploy the sequential logic design techniques for developing various counters and Registers.

CO4. Demonstrate the knowledge of 8086 Microprocessor architecture to develop assembly language programs by applying various addressing modes, instructions sets, and assembler directives of the 8086 microprocessors.

Q.No	Question	M	CO	BL
1.	Design a clocked synchronous sequential circuit using T flip-flops based on a state diagram with two inputs and one output.	10	CO2	BL3
2.	Design a synchronous counter that follows a non-standard decreasing sequence of states represented by the binary values: 110, 101, 011, 010, 000, and back to 110, using JK flip-flops. Derive the necessary flip-flop input equations and implement the logic circuit accordingly.	10	CO3	BL3
3.	The PIPO stage is used to initialize a 4-bit Johnson counter. Assume the initial state as	10		

	1000, After 6 clock pulses, determine the state sequence of the counter, then modify the system to function as a Ring Counter instead of a Johnson Counter. What changes would be required, and what would be the state sequence after 6 clock pulses?		C03	BL5
4.	Analyze the following circuit and derive the excitation and output equations. Write the next state equation and construct a transition table. Draw the state diagram.	10	C02	BL4
5.	i) The contents of the segment registers and offset registers in a 16-bit microprocessor system are given: CS = 4A3F, IP = 1F2C, DS = 3C20, DI = 12E5, SI: 11A4, SS = 52B1, SP = 0F4A. Calculate the physical addresses for the given CS: IP, DS: DI, DS: SI and SS: SP pairs.	4	C04	BL3
	ii) Write the name of addressing mode for the following a. MOV AL, [BX + SI + 2FH] b. MOV DX, [BP + 10H] c. MOV [DI], CX d. MOV CX, [BP + DI] e. MOV AX, 1234H f. MOV AX, [BX]	6		