

**B.E. ELECTRICAL ENGINEERING 2<sup>ND</sup> YEAR 2<sup>ND</sup> SEMESTER EXAMINATION-2024****Subject: SEQUENTIAL SYSTEMS AND MICROPROCESSORS****Time : 3 Hours**

Use separate answer script for each Part

**Full Marks: 100****Part: I (50 Marks)**

Question No.	Question No 1 is compulsory Answer any two question from the rest (2x20)	Marks
Q1.	Answer any five question (5X2=10)	
	(a) How many memory locations can be addressed by a microprocessor with 14 address lines ?	2
	(b) What is the function of accumulator ?	2
	(c) Why is the data bus bi-directional?	2
	(d) State the difference between a microprocessor and a microcomputer.	2
	(e) State the difference between machine language and assembly language.	2
	(f) How many address lines are necessary on the chip of 2K (2048) byte of memory ?	2
	(g) Define $\overline{INTA}$ and $TRAP$ signal.	2
	(h) How do you distinguished between MOV and MVI command ?	2
	(i) In the Opcode Fetch cycle, what are the control and status signals asserted by the 8085 to enable the memory buffer?	2
Q2.	(a) Illustrate the GP registers and Flag registers of the 8085 microprocessor.	3+3
	(b) If the 8085 microprocessor adds 87H and 79 H, specify the content of the Accumulator and the status of the S, Z, and Carry flags.	6
	(c) Write an assembly language program for the 8085 microprocessor to add two 8 bit numbers, 32H and 05H and stored the result in the memory location 8030H.	8
Q3.	(a) What are tristate devices and why are they essential in a bus oriented system ?	2+2
	(b) Draw the block diagram and logic diagram of the bi-directional buffer?	2+2
	(c) The instruction code (0011 1111) 3FH is stored in the memory location 8005H. List the sequence of events when the instruction code is fetched by the MPU.	4
	(d) Write an assembly language program for the 8085 microprocessor to find 1's and 2's complement of 05H and 3AH respectively.	4+4
Q4.	(a) Define Encoder and Decoder of the 8085 microprocessor with example.	4
	(b) Illustrate 'Instruction cycle', 'Machine cycle' and 'T state' with proper example.	6
	(c) If the clock frequency is 2 MHz, calculate the execution time for 12 T States.	2
	(d) Describe the classification of memory of the 8085 microprocessor.	8
Q5.	(a) Illustrate the signals (with diagram) of the 8085 microprocessor.	6
	(b) Explain the need to de-multiplex the bus $AD_7 - AD_0$ .	2
	(c) List the four operations primarily performed by the MPU.	4
	(d) Write an assembly language program for the 8085 microprocessor to subtract 30H from 39H and display the result in the memory location 8050H.	8

**BACHELOR OF ENGINEERING (ELECTRICAL ENGINEERING)  
SECOND YEAR SECOND SEMESTER EXAM 2024**

**SEQUENTIAL SYSTEMS & MICROPROCESSOR**

**Time:** Three Hours

**Full Marks:** 100

( 50 marks for each part)

Use a separate Answer-Script for each Part

**PART- II ( 50 Marks)**

Answer *any three* questions from this part.

*Two* marks are reserved for neat and well organised answer

1. a) Describe the terms NO, NC and Rung in the context of ladder diagram. ( CO1) 4  
 b) A system is described by,  $Y=(A+B.(A+B))+B.(A+B)+AB$  (CO3)  
 i) Simplify the system using Boolean Algebra 4+4+4  
 ii) Implement the original expression through ladder diagram.  
 iii) Implement the simplified expression through digital circuit.

2.	a) Draw the basic block diagram of a Moore machine and describe the functions of each block. Also explain the difference between Moore and Mealy Machine. (CO2)	8
	b) With the help of neat sketch, show the essential parts of a relay and describe its operation. Also indicate how the specification of a relay can be written. (CO2)	8
3.	a) Describe with suitable circuit diagram the operation a 4-bit Shift Left Register using D FF having parallel and serial loading capability. (CO2)	8
	b) Define Propagation delay time, Set-up time time and Hold time in the context of flipflop operation. (CO3)	8
4.	a) Enumerate different types of memories that are used in digital systems and explain their basic features. (CO4)	8

	b) Design a 1024X4 bit Read and Write Memory (RWM) chip using 512X4 bit memory chips. Sketch the final memory system taking any starting address. (CO4)	8
5.	a) Draw a Ladder diagram to implement through a PLC system for the STAR/DELTA starter of three phase induction motor. The starter is also fitted with STOP and OVERLOAD and over temperature protection. Draw power circuit diagram also and indicate inputs and outputs. (CO5)	10
	b) What are field switches? Name four field switches that are used in PLC based system. (CO3)	6