

B. ELECTRICAL ENGG. 2ND YEAR 2ND SEMESTER EXAMINATION, 2017(1st / 2nd Semester/Repeat/Supplementary/Annual/Bi-Annual)**SUBJECT: - SEQUENTIAL SYSTEMS AND MICROPROCESSORS**

Time: Three hours

Full Marks 100
(50 marks for each part)

Use a separate Answer-Script for each part

No. of Questions	PART I	Marks
	Answer any three Questions Two marks are for neat and systematic answers	
Q1.	a) Enumerate relative advantages and disadvantages between a relay logic and programmable logic based system. b) A system is described by, $Y=C.(A+B.(A+B))+B.(A+B)$ i) Simplify the system using Boolean Algebra ii) Implement the original expression through ladder diagram. iii) Implement the simplified expression through digital circuit.	4 2+4+6
Q2.	a) Draw the basic block diagram of a Mealy machine and describe the functions of each block. Also explain the difference between Moore and Mealy Machine. b) Using T-FFs design a counter counting in the sequence 001, 011, 010, 110, 111, 101, 001....	8 8
Q3.	a) Draw the block diagram of a 4-bit bi-directional shift register using D-FF having parallel loading facility. Also explain the operation of the control functions. b) Explain different symbols that are used to draw state diagram of a sequential system.	6+4 6
Q4.	a) Define Read Cycle time, Write Cycle time and Access time in context with the specifications of a memory chip. b) Design a 256X8 bit Read and Write Memory (RWM) using 128X4 bit memory chips. Sketch the diagram for the designed memory chip. c) Explain the functions of chip select signal with respect to a memory chip.	6 8 2

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No. of Questions	PART I	Marks
Q5.	<p>a) A weigh machine is designed as follows: When a person stands on the board, the machine will ask for a coin. When the coin is inserted, the machine checks the diameter and weight of the coin. If any of the parameters is wrong the machine rejects and goes to initial state. If both are okay the machine displays the weight and goes to initial state. Describe the system with state diagram defining the states clearly.</p> <p>b) What are field switches? Name four field switches that are used in PLC based system.</p>	<p align="center">12</p> <p align="center">4</p>

BACHELOR OF ELECTRICAL ENGINEERING EXAMINATION, 2017(2nd Year, 2nd Semester)**SEQUENTIAL SYSTEMS AND MICROPROCESSORS**

Time: Three hours

(50 marks for each Part)

Full Marks: 100

Use a separate Answer-Script for each Part

PART- IIAnswer *any three* questions.*Two marks* are reserved for neatness and well organized answers.

1.a)	How does a microprocessor differentiate between data and instruction code? How many memory locations can be addressed by a microprocessor with 14 address lines?	(3+2)
b)	Discuss the functions of program counter and stack pointer of Intel 8085 microprocessor? In which state does the CPU send the ALE signal for demultiplexing?	(3+2)
c)	Briefly explain the functions of the following pins of 8085 microprocessor : (i) READY (ii) S ₀ , S ₁ (iii) AD ₀₋₇	(6)
2.a)	Discuss in detail the operation when instruction CALL is executed.	(6)
b)	The initial content of Accumulator of 8085 is considered to be 6DH and all the bits of the flag register are reset. Write the content of accumulator and the flag register after execution of each of the following instructions: (i) RAR (ii) CPI 57H (iii) ADI 57H (iv) MOV B,A (v) DCR A	(5 x 2)
3.a)	If a 4MHz crystal frequency is connected with 8085 microprocessor, what is the value of system clock frequency? Compute the execution time of instruction STA 8050H for same microprocessor.	(4)
b)	Explain how RIM instruction is used to sense the pending interrupts with the help of word format and programming.	(5)
c)	Mention all the machine cycles that are present in 8085 microprocessor. Draw and discuss the timing diagram of MOV A, B the corresponding hex code being 78H.	(3+4)
4.a)	What are the operating modes of 8255? What will happen if the strobe line of 8255 is tied low?	(5)
b)	Discuss the control word format for 8255 in BSR mode.	(6)
c)	Configure Port A as strobed input port, port B strobed output port and PC6, PC7 as output lines for 8255.	(5)
5.	Write assembly language program in 8085 to perform the following operations: (i) to see the content of flag register (ii) to convert Hexadecimal to Binary (iii) to sort an array of N numbers in ascending order.	(4+5+7)