

**BONAM VENKATA CHALAMAYYA INSTITUTE OF TECHNOLOGY & SCIENCE
(AUTONOMOUS)**

II - B. Tech I-Semester Supplementary Examinations (BR23), Mar - 2026

SWITCHING THEORY AND LOGIC DESIGN (ECE)

Time: 3 hours

Max. Marks: 70

*Question Paper consists of Part-A and Part-B
Answer ALL the question in Part-A and Part-B*

PART-A (10X2 = 20M)

	Marks	CO	BL
1. a) Convert $(AEC.D)_{16}$ to $()_{10}$	(2M)	CO1	BL2
b) Find 1's and 2's complements of $(148)_{10}$	(2M)	CO1	BL1
c) What are universal gates and mention their names	(2M)	CO2	BL1
d) Mention the truth table of a Half adder with its equations	(2M)	CO2	BL1
e) How many types of logic gates are there and mention their names	(2M)	CO3	BL1
f) Mention the advantages and disadvantages of Multiplexers	(2M)	CO3	BL1
g) Mention any two flip flops with their truth tables	(2M)	CO4	BL1
h) Mention any three applications of a comparator	(2M)	CO4	BL1
i) Explain mealy and moore models	(2M)	CO5	BL2
j) Explain the procedure of mealy to moore conversion	(2M)	CO5	BL2

PART-B (5X10 = 50M)

2a. Realise $(AB+BC+AC) (B+C)$ Using Logic gates.	5(M)	CO1	BL2
b. Convert Boolean function $ABC+A+AC+BC$ into standard POS form (OR)	5(M)		BL2
3a. Realise Ex-OR gate and Ex-NOR gate using NAND gates.	5(M)	CO1	BL2
b. A 7 bit hamming code received as 1101011. Use even parity to check any error in this code	5(M)		BL3
4a. Simplify the Boolean expression $F(a,b,c,d) = (0,1,2,4,5,8,9,11,13,15)$ using K-Map	5(M)	CO2	BL4
b. Design a full adder using half adders (OR)	5(M)		BL6
5a. Explain Excess-3 adder circuit using an example	5(M)	CO2	BL2
b. Mention any four Boolean theorems with proofs	5(M)		BL1
6a. Design a BCD to Decimal Decoder	5(M)	CO3	BL6
b. Explain about a multiplexer and mention its applications (OR)	5(M)		BL2
7a. Implement a full adder circuit with a decoder and two or gates	5(M)	CO3	BL3
b. Explain a 2 to 4 line decoder with its truth table and enable (E) input	5(M)		BL2
8a. Explain truth table and excitation tables of J-K Flip Flop and D Flip Flop	5(M)	CO4	BL2
b. Design a BCD counter with J-K Flip Flops	5(M)		BL6

(OR)

- 9a. Draw the logic circuit of a 4-bit register with parallel load and explain its operation
- b. Explain the operation of 4-bit binary Ripple counter

5(M) CO4 BL3
5(M) BL2

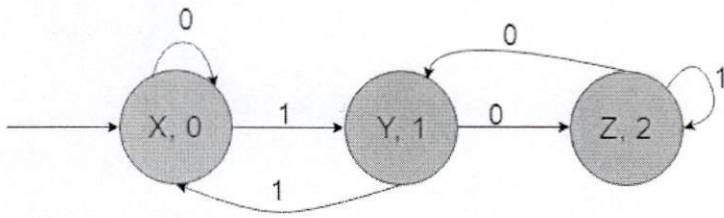
- 10a Explain the terms state table and state diagrams with an example
- b Explain why a Mealy machine might require fewer states than an equivalent Moore machine

5(M) CO5 BL2
5(M) BL2

11a

(OR)

10(M) CO5 BL3



Meelay machine

convert this Moore to
