



B.Tech III Semester Regular/Supplementary Examinations, December 2025
DIGITAL LOGIC DESIGN
(ECE)

Maximum Marks: 60

Date: 30.12.2025

Duration: 3 hours

- Note:**
1. This question paper contains two parts A and B.
 2. Part A is compulsory which carries 10 marks. Answer all questions in Part A.
 3. Part B consists of 5 Units. Answer any one full question from each unit.
 4. Each question carries 10 marks and may have a, b, c, d as sub questions.

Part-A

All the following questions carry equal marks		(10X1M=10 Marks)	Marks	CO	BTL
1.a)	What is the decimal equivalent of the binary number $(101)_2$?		1M	1	L2
b)	What is the 2's complement of the binary number $(1101)_2$?		1M	1	L2
c)	Write the truth table of Ex-OR Gate		1M	2	L2
d)	What the use is of don't care combinations?		1M	2	L2
e)	Write the truth table of half adder.		1M	3	L2
f)	Write a short notes on priority encoder.		1M	3	L2
g)	What is a flip-flop?		1M	4	L2
h)	Mention atleast one Difference between a latch and a flip flop.		1M	4	L2
i)	Define Hazard. Mention various types of hazards.		1M	5	L2
j)	What is Shift register?		1M	5	L2

Part-B

Answer All the following questions.		(5X10M=50Marks)	Marks	CO	BTL
2	Classify the Binary Code to Decimal, Octal, Hexa decimal with an example.		10M	1	L3
OR					
3	a) Convert the given Gray code number 1101 to equivalent binary. b) Perform $(745)_{10} - (436)_{10}$ using 9's complement Subtraction method.		5M 5M	1	L2
4	Obtain the simplified expression in SOP form of $F(a,b,c,d) = \sum m(1,2,3,4,6,12,13,14)$ using K-maps.		10M	2	L3
OR					
5	What are universal logic gates? Realize all basic gates using NAND and NOR gate.		10M	2	L2
6	Design a 3-bit comparator.		10M	3	L2
OR					
7	State the truth table and draw the circuit for 2×1 Multiplexer. Design a 16×1 Multiplexer using 2×1 Multiplexers.		10M	3	L3

8	a) Convert D Flip flop into JK flipflop. b) Design a 3-bit synchronous counter using T flip flops.	4M 6M	4	L3
OR				
9	Explain the operation of master slave JK flip flop. Explain its truth table.	10M	4	L2
10	a) With a neat diagram explain about 4-bit bidirectional shift register. b) Design a 3 bit Ripple counter	5M 5M	5	L2
OR				
11	Design 3-bit Twisted Ring Counter. Explain its operation with timing diagrams.	10M	5	L3