Reg. No.																

Question Paper Code	14744

B.E. / B.Tech. - DEGREE EXAMINATIONS, APRIL / MAY 2026

Third Semester

Electrical and Electronics Engineering

20EEPC304 - DIGITAL LOGIC CIRCUITS

Regulations - 2020

Duration: 3 Hours | Max. Marks: 100

PART – A (i) (MCQ)
(16 × 1 = 16 Marks)
Answer ALL Questions

		Marks	K – Level	CO
1.	The base of the hexadecimal number system is a) 2 b) 8 c) 10 d) 16	1	K1	CO1
2.	Hamming code is used for a) Compression b) Error correction c) Encryption d) Modulation	1	K2	CO1
3.	ECL logic is a) Emitter Coupled Logic b) Emitter Collector Logic c) Enhanced Coupled Logic d) Enhanced Collector Logic.	1	K1	CO1
4.	Each term in canonical SOP is referred as a) Maxterm b) Minterm c) Upperterm d) Lowerterm	1	K1	CO2
5.	Total number of cells in a K map used for three variables is a) 2 b) 4 c) 8 d) 16	1	K2	CO2
6.	A multiplexer is a a) One to many device b) Many to one device c) Storage device d) Converter	1	K1	CO2
7.	Flip flop is a a) Combinational circuit b) Sequential circuit c) Analog circuit d) Memoryless circuit	1	K1	CO3
8.	A counter is used for a) Storage b) Counting pulses c) Conversion d) Amplification	1	K1	CO3
9.	Edge triggering occurs at a) Constant level b) Transition c) High level d) Low level	1	K2	CO3
10.	Hazard is a) Stable condition b) Temporary fluctuation c) Permanent error d) Output storage	1	K1	CO4

11.	Asynchronous circuits are faster because		1	K2	CO4
	a) No clock delay	b) Less gates			
	c) Low power	d) High voltage			
12.	Stability means		1	K1	CO4
	a) Constant input	b) Constant output			
	c) No change in state	d) Fast switching			
13.	FPGA stands for		1	K1	CO5
	a) Field Programmable Gate Array	b) Fast Programmable Gate Array			
	c) Fixed Programmable Gate Array	d) Field Preloaded Gate Array			
14.	VHDL is used for		1	K1	CO5
	a) Programming	b) Hardware description			
	c) Simulation	d) Designing			
15.	PROM stands for		1	K1	CO5
	a) Programmable Read Only Memory	b) Permanent ROM			
	c) Primary ROM	d) Parallel ROM			
16.	Simulation is used for		1	K1	CO5
	a) Testing circuits	b) Designing circuits			
	c) Verification	d) All			

PART – A (ii) (Short Answer Questions)
(8 × 3 = 24 Marks)

Answer ALL Questions

17.	Name the different number systems used in digital circuits.	3	K1	CO1
18.	Compare DTL and TTL integrated circuits.	3	K2	CO1
19.	State De-Morgan's laws.	3	K1	CO2
20.	Differentiate multiplexer and de-multiplexer circuits.	3	K2	CO2
21.	Specify the functions of register in digital circuits.	3	K2	CO3
22.	Distinguish critical race and non critical race.	3	K2	CO4
23.	Write the advantages of asynchronous circuits.	3	K1	CO4
24.	Mention the different types of VHDL program modelling.	3	K1	CO5

PART - B (Descriptive Answer Questions)
(5 × 12 = 60 Marks)

Answer ALL Questions

25.	a)	Examine the Hamming code for information code 10111_2 by using even parity.	12	K4	CO1
		OR			
	b)	Compare and classify the features and characteristics of MOS and ECL integrated circuits.	12	K4	CO1
26.	a)	Develop and realize 8:1 multiplexer combinational logic circuit using logic gates.	12	K3	CO2
		OR			
	b)	Develop and realize full adder combinational logic circuit using logic gates.	12	K3	CO2
27.	a)	Examine the different types of flip flops used in digital circuits.	12	K4	CO3
		OR			
	b)	Inspect and realize synchronous mod - 8 counter using JK flip flops for UP mode performance.	12	K4	CO3

28.	a)	Identify the different hazards and errors in asynchronous sequential circuits.	*12*	*K3*	*CO4*
		OR			
	b)	Construct an Asynchronous sequential circuit with two inputs X_1 and X_2 and with one output Z. Initially both inputs are equal to zero. When X_1 changes from 0 to 1, then Z = 1 and when X_2 changes from 0 to 1, then Z = 0 and Z = 0 otherwise. Realize the circuit by using JK Latches	*12*	*K3*	*CO4*
29.	a)	Compare the different programmable logic devices used in digital circuits with their applications.	*12*	*K4*	*CO5*
		OR			
	b)	Analyze an HDL behavioral description of 4:1 MUX using if-else statement.	*12*	*K4*	*CO5*