TED (21) - 3044
(REVISION-2021)

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Reg.No……
Signature…….

DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/ MANAGEMENT/COMMERCIAL PRACTICE, NOVEMBER - 2024

DIGITAL ELECTRONICS

[Maximum Marks:75] [Time: 3 Hours]

PART - A

I. Answer all the following questions in one word or one sentence. Each question carries 'one' marks.

(9 x 1 = 9 Marks)

		Module Outcome	Cognitive level
1	Binary equivalent of $\mathbf{F_{16}}$ is.....	M 1.01	U
2	Write 2's complement form of **-35**.	M 1.02	U
3	NAND and NOR are .....Gates.	M 1.03	R
4	What is VLSI?	M 2.01	R
5	Draw the logic diagram of a half adder.	M 2.04	U
6	A flip-flop has .....Stable states.	M 3.02	U
7	Name asynchronous inputs in a flip-flop.	M 3.02	U
8	Asynchronous counters are also called.....	M4. 01	U
9	The.....Memory can store data even if power is turned off.	M4.04	U

PART - B

II. Answer *any eight* questions from the following. Each question carries 'Three' marks.

(8 x 3 = 24 Marks)

		Module Outcome	Cognitive level
1	Perform 2's complement addition. **1101-1001**	M1.02	U
2	Show that $\boldsymbol{A \oplus B = A\bar{B} + \bar{A}B}$ and construct the corresponding logic diagrams.	M1.03	U
3	Draw the logic diagram for $\mathbf{Y=(A + B)(A + \bar{B})(\bar{A} + \bar{B})}$.	M1.04	A
4	Define the terms a) Fan-in b) noise margin	M2.02	U
5	Design a half subtractor using its truth table.	M2.04	A
6	Write the truth table and draw the logic diagram of **4 x 1** multiplexer.	M2.04	U

7	Differentiate between combinational and sequential logic circuits.	M3.01	U
8	Draw the logic diagram of a 4 bit Ring counter.	M3.04	U
9	Define modulus of the counter and write the number of states in a mod-4 counter.	M4.01	U
10	Compare RAM and ROM.	M4.04	U

PART - C

Answer all the questions from the following. Each question carries 'seven' marks.

(6 x 7 = 42 Marks)

		Module Outcome	Cognitive level
III.	Perform the following operations a) $69_{16} - 43_{16}$ b) $27_{16} - 73_{16}$	M1.02	U
	OR		
IV.	Reduce the expression $\sum m$ **(1, 5, 6, 12, 13, 14)** + d**(2, 4)** using **K**-map.	M1.04	A
V.	Realize EX-OR and AND gate using NOR gate.	M1.03	U
	OR		
VI.	Minimize the following function using K- map and realize using logic gates. **F =** $\sum m$**(0, 1, 4, 5, 10, 11, 14, 15)**	M1.04	A
VII.	Design a 4 bit Gray to Binary code converter.	M2.04	U
	OR		
VIII.	Design a 3 line to 8 line decoder.	M2.04	A
IX.	With the help of logic diagram explain the working of Serial in serial out shift register.	M3.03	U
	OR		
X.	Explain Johnson counter with logic circuit.	M3.04	U
XI.	With the help of necessary diagrams explain the working of Parallel in Serial out shift register.	M3.03	U
	OR		
XII.	Explain the working of JK flip flop with the help of a diagram using NAND gates.	M3.02	U
XIII.	Design a mod 6 asynchronous counter using T flip-flops.	M4.02	A
	OR		
XIV.	Write notes on different types of RAM.	M4.04	U

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