TED (21) -3134
(Revision- 2021)

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Reg.No…….....
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DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/MANAGEMENT/ COMMERCIAL PRACTICE, NOVEMBER - 2024

DIGITAL COMPUTER FUNDAMENTALS

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

PART–A

I. Answer **all** the following questions in one word or sentence. Each question carries 1 mark.

(9x1=9 marks)

		Module Outcome	Cognitive level
1	…….is the base of the octal number system.	M1.01	R
2	One's complement of 1101 is…….	M1.01	U
3	……..is the output of a 2 input NOR gate when its 2 inputs are 1 and 0.	M2.03	R
4	A'.A=……..	M2.01	R
5	Simplified value of Σm(0,1,2,3,4,5,6,7)=……..	M2.05	U
6	Grey code of a binary number 1101 is…….	M3.05	U
7	Write True or False, Feedback circuits are used in combinational circuits.	M3.01	R
8	Write True or False, A Common clock signal is present in a synchronous circuit.	M4.04	U
9	In ripple counter…….number of Flip-flop is needed to count up to 1111.	M4.04	U

PART B

II. Answer **any Eight** questions from the following. Each question carries 3 marks.

(8x3=24 marks)

		Module Outcome	Cognitive level
1	Convert $(1111011)_2$ to $(\ )_8$.	M1.01	U
2	Explain error detecting and correcting code.	M1.04	R
3	Map the expression Σm(0,2,3) in K map.	M2.05	U
4	Draw the symbol and truth table of a NOR gate.	M2.03	R
5	Construct a NOT gate using a NAND gate.	M2.04	U
6	Explain DE Morgan's first law.	M2.01	U
7	Draw the diagram of a four bit binary parallel adder.	M3.03	R
8	Explain an encoder with a block diagram.	M3.04	R
9	Explain a sequential circuit with a block diagram.	M4.01	R
10	Explain race around condition in JK Flip-flop and how it can be solved.	M4.02	U

PART C

Answer **all** questions from the following. Each question carries 7 marks.

(6x7=42marks)

		Module Outcome	Cognitive level
III	Convert (a) $(1110111)_2$ to $(\ )_{10}$ (3.5 marks) (b) $(3743)_8$ to $(\ )_{16}$ (3.5 marks)	M1.01 M1.01	A A
	OR		
IV	Perform the subtraction using 2's complement method 101011-11001	M1.02	A
V	Reduce the Expression f=A[B+C'(AB+AC')']	M2.02	A
	OR		
VI	Simplify Using K Map f=Π M(4,6,11,14,15)	M2.05	A
VII	Design and Explain a 4bit binary adder / subtractor.	M3.03	U
	OR		
VIII	Explain a BCD adder with a Diagram.	M3.03	U
IX	Explain a 2 bit Binary Multiplier with a Logic Diagram.	M3.04	U
	OR		
X	Design a Half Adder.	M3.02	U
XI	Compare sequential and Combinational Circuit.	M4.01	U
	OR		
XII	Explain an asynchronous sequential circuit and synchronous sequential circuit.	M4.04	R
XIII	Explain any three types of shift registers with block diagrams.	M4.03	R
	OR		
XIV	Design a 4 bit ripple counter.	M4.04	U

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