TED (21) 3134
(Revision – 2021)

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Reg. No……
Signature …….

DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/ MANAGEMENT/COMMERCIAL PRACTICE, NOVEMBER – 2022

DIGITAL COMPUTER FUNDAMENTALS

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

PART-A

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

(9 x 1 = 9 Marks)

		Module Outcome	Cognitive level
1.	Convert 28_{16} to binary.	M1.01	A
2.	Find 2's complement of 10001	M1.01	A
3.	How negative numbers are represented in computers?	M1.03	U
4.	……..are called Universal gates.	M2.03	R
5.	Draw the truth table of two input OR gate.	M2.04	R
6.	Expansion of BCD is……	M3.03	R
7.	The asynchronous inputs of Flip Flops are……and ……..	M4.02	U
8.	Write the equation of the outputs of Half adder circuit.	M3.02	R
9.	Define sequential logic circuit.	M4.01	R

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.	Add the decimal numbers 25 and 48 converting of BCD format.	M1.05	A
2.	Explain Gray codes.	M1.04	U
3.	State Demorgan's Laws.	M2.01	R
4.	Draw the truth table corresponds to the function. **F (x,y,z) = Σ (1,3,4,6)**	M2.05	A
5.	Prove that x+xy=x	M2.01	A
6.	Design the logic diagram of AND gate using NOR gate, and write the truth table.	M2.04	A
7.	Draw the circuit and truth table of 2 to 1 multiplexer.	M3.04	U
8.	Construct the combinational circuit for Boolean equation. **F=(A+B).CD**	M3.01	U
9.	Draw the circuit of 3 bit **Parallel In Parallel Out** shift register and explain its working.	M4.03	A
10.	Construct SR latch with NAND gates.	M4.02	U

PART-C

Answer all questions. Each question carries *'seven'* marks.

(6 x 7 = 42 Marks)

		Module Outcome	Cognitive level
III.	Write the result of the following operations. a) Convert 11011_2 to decimal and hexadecimal. (2 marks) b) $11A_{16}$ to Decimal (2 marks) c) 242_{10} to Binary and Octal (3 marks)	M1.01	A
	OR		
IV.	a) What are error detection codes? How parity bit helps to detect transmission errors? (4 marks) b) What is BCD codes? Add BCD numbers 1000 and 0101. (3 marks)	M1.04 M1.05	U A
V.	Implement the logic functions of Basic Gates using NAND gate. (7 marks)	M2.04	U
	OR		
VI.	Construct the logic diagram for the Boolean function by simplifying using K-Map. **F(x,y,z)= x'yz + xy'z' + xy'z + xyz** (7 marks)	M2.05	A
VII.	Develop the truth table of full adder and draw its logic diagram. (7 marks)	M3.02	U
	OR		
VIII.	Construct a 4 bit binary adder subtractor and explain its working. (7 marks)	M3.04	A
IX.	Construct the logic diagram of magnitude comparator and explain. (7 marks)	M3.04	A
	OR		
X.	Explain Decoders and Encoders with block diagram. (7 marks)	M3.04	U
XI.	Construct the Logic diagram of JK Flip flop and explain its working with the help of characteristics table. (7 marks)	M4.02	A
	OR		
XII.	Construct a 3 bit Ring counter and explain its working. (7 marks)	M4.04	A
XIII.	Design an Asynchronous 4 bit Binary UP counter and explain its working. (7 marks)	M4.03	A
	OR		
XIV.	Explain different types of Shift registers. (7 marks)	M4.03	U

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