TED (21)-3134
(Revision - 2021)

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DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/MANAGEMENT/ COMMERCIAL PRACTICE, NOVEMBER - 2025

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 1 mark.

(9 x 1 = 9 Marks)

		Module outcome	Cognitive level
1	Convert the octal 704_8 to binary.	M1.01	A
2	Find 2's complement of 1101.	M1.02	A
3	Expansion of ASCII is ……..	M1.04	R
4	A three bit binary counter has……. number of states.	M4.04	R
5	Draw the truth table and logic symbol of two input NAND gate.	M2.03	U
6	Construct the K Map corresponds to two input AND gate.	M2.05	U
7	A multiplexer circuit with 2^n inputs have…..number of select lines and……number of output lines.	M2.04	U
8	Differentiate sequential logic and combinational logic circuits.	M3.01	U
9	What are the Asynchronous inputs of a flip flop?	M4.02	R

PART B

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

(8 x 3 = 24 Marks)

		Module outcome	Cognitive level
1	Find the result of $ABCD_{16} + 4321_{16.}$	M1.01	A
2	How parity bit is used in error detection method?	M1.04	U
3	State Demorgans laws.	M2.01	R
4	Prove that x(x+y) = x.	M2.02	A
5	Design the function of two input AND gate using NAND gates.	M2.04	A
6	Draw the truth table and logic diagram of two input XOR gate.	M2.03	U
7	Explain the circuit of a Half adder with truth table.	M3.02	U
8	Draw the block diagram of 2 to 1 Multiplexer and write its truth table.	M3.04	U
9	Compare Synchronous and Asynchronous counters.	M4.04	U
10	Construct SR latch using 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	Find the result of the following operations. a) 375_8 to Decimal (2Marks) b) $ABCD_{16}$ to Binary and Octal (2 Marks) c) 258_{10} to Binary and Hexadecimal (3Marks)	M1.01	A
	OR		
IV	a) Explain ASCII codes and Grey codes. (4 Marks) b) Add the decimal numbers 6 and 7 after converting it to BCD format. (3 Marks)	M1.04 M1.05	U A
V	Implement the functions of Basic Gates using NOR gates. (7 Marks)	M2.04	A
	OR		
VI	Simplify the following function in SOP and POS using K map $F(A,B,C,D) = \sum (0,1,2,5,8.9.10)$. (7 Marks)	M2.05	A
VII	Construct the truth table of full adder and implement its logic circuit. (7Marks)	M3.02	U
	OR		
VIII	Construct a BCD adder circuit and describe its working. (7Marks)	M3.03	U
IX	Design a 4 bit parallel binary adder circuit and explain. (7Marks)	M3.04	U
	OR		
X	Draw the circuit of 2 to 4 decoder and explain. (7Marks)	M3.04	U
XI	Explain different types of Shift registers. (7Marks)	M4.03	U
	OR		
XII	Construct 3 bit ring counter and explain its working. (7Marks)	M4.04	A
XIII	Design a T flip flop using JK flip flop and explain its working. (7Marks)	M4.02	A
	OR		
XIV	Design a 4 bit Asynchronous up counter and explain its working. (7Marks)	M4.03	A

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