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(Revision – 2021)

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

DIGITAL CIRCUITS AND SYSTEMS

[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.	Write the decimal equivalent of binary number 1011.	M1.01	A
2.	The term ---------- means many into one.	M2.03	R
3.	---------- is a code convertor circuit which is used to convert an active input signal to coded output signal.	M2.04	U
4.	Gray code for the binary number 1010 is ----------	M2.06	A
5.	---------- circuits are those in which present values of output depends on the present values of input as well as past values of output.	M3.01	U
6.	In SR flipflop S=l and R= l is called---------- state.	M3.02	R
7.	Write the characteristic equation of a JK flip flop.	M3.02	U
8.	How many flip flops are required to build a counter that count from 0 to 10.	M3.06	U
9.	---------- signals are varying with time.	M4.04	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.	Differentiate between Min term and Max term in Boolean expression.	M1.02	U
2.	Draw the logic diagram of half adder and truth table.	M2.01	U
3.	Explain asynchronous sequential circuits.	M3.01	U
4.	Explain the working of serial input serial output shift register.	M3.04	U
5.	Draw the logic diagram of D flipflop.	M3.02	U
6.	Explain S-R flip flop with truth table.	M3.02	U
7.	Differentiate between sequential circuits and combinational circuits.	M3.01	U
8.	Explain race around problem in JK flipflop? How it can be avoided?	M3.02	U
9.	Differentiate between synchronous counter and asynchronous Counter.	M3.06	U
10.	State the term monotonicity and resolution in DAC.	M4.04	R

PART-C

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

(6 x 7 = 42 Marks)

		Module Outcome	Cognitive level
III.	(a) Explain the l's compliment and 2's compliment method.	M1.01	A
	(b) Subtract 1100 1001 and 0011 0001 using 2's compliment.	M1.01	A
	OR		
IV.	Reduce the following expressions		
	(a) Y= ABC(AB+$\bar{C}$)(BC+AC)	M1.02	A
	(b) Y= $\overline{A+\bar{B})(\bar{C}+D)}$	M1.02	A
V.	Explain OR, XOR, XNOR gates with truth table.	M1.02	U
	OR		
VI.	Simplify the following expression Y=Σm(0,1,2,4)+d(3,7) Using K Map.	M1.03	A
VII.	Design a full adder circuit and implement it using NAND gates only.	M2.01	A
	OR		
VIII.	Design 1-4 Demultiplexer with basic gates.	M2.03	U
IX.	Design a 4-1 MUX circuit with basic gates.	M2.03	U
	OR		
X.	Design a BCD to Decimal Convertor.	M2.04	U
XI.	Explain parallel in parallel out shift registers with neat diagram.	M3.04	U
	OR		
XII.	Describe 3bit up/down asynchronous counter with truth table.	M3.08	U
XIII.	Explain binary weighted DAC with necessary equations and neat diagram.	M4.01	U
	OR		
XIV.	Explain counter type ADC with neat diagram.	M4.03	U

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