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

ANALOG & DIGITAL CIRCUITS

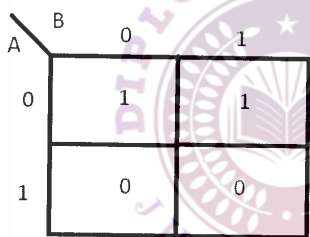[Maximum Marks: **75**]　　　　　　　　　　　　　　　　　　[Time: **3** Hours]

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.	List any two coupling schemes used in multistage transistor amplifier.	M1.01	R
2.	An oscillator employs …………feedback.	M1.02	R
3.	Define CMRR of an op amp.	M2.01	R
4.	Select any one purpose of a half-wave precision rectifier.	M2.04	R
5.	Write 2's complement of 10110	M3.01	A
6.	Draw the symbol of AND gate.	M3.02	R
7.	K map for the function F is shown below. Write the reduced expression for F.	M3.04	A
8.	Write the truth table of half adder.	M4.01	R
9.	The number of select lines required for a 4 x 1 multiplexer is……….	M4.01	A

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.	State the importance of coupling in amplifiers.	M1.01	R
2.	Draw the block diagram of an opamp and label all the blocks.	M2.01	R
3.	List any three characteristics of an ideal op amp.	M2.01	R
4.	Draw the circuit for the addition of three input signals using op amp.	M2.03	U
5.	Draw the circuit of a zero crossing detector using op amp.	M2.04	U
6.	Divide the binary number $(1001110)_2$ by $(100)_2$	M3.01	A
7.	List the universal gates. Draw the symbol and write the truth table.	M3.02	R

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8.	Simplify the expression Y=$\overline{(\overline{A} + B) + CD}$ using DeMorgan's theorem.	M3.0:	
9.	Convert the given SOP expression to its standard form. f (A,B,C) = AB + BC + AC	M3.04	A
10.	List any three applications of flip flop.	M4.02	R

PART-C
Answer all questions. Each question carries 'seven' marks.

(6 x 7 = 42 Marks)
Module Outcome   Cognitive level

III.	Compare class A, class B and class C power amplifiers. Write any four comparisons.	M1.01	U
	OR		
IV.	With the help of block diagram, distinguish between positive and negative feedback.	M1.02	U
V.	Explain the working of a RC phase shift oscillator with a neat sketch.	M1.03	U
VI.	**OR** Illustrate the working of bistable multivibrator using transistor.	M1.04	U
VII.	Draw the circuit diagram of a differentiator circuit using op amp. Derive the expression for the output voltage. **OR**	M2.03	U
VIII.	Summarise the operation of an inverting amplifier using op amp.	M2.02	U
IX.	Convert the following binary numbers to decimal and hexadecimal numbers. a) 1101.101 b) 10010.01 **OR**	M3.01	R
X.	Simplify the expression $f(A, B, C) = \Sigma m(0,2,3,4,5,6)$ using K map.	M3.04	A
XI.	Explain the implementation of a full adder using half adders. **OR**	M4.01	U
XII.	Explain a mod 8 ripple counter using JK flip flop.	M4.03	U

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XIII.	Draw the logic diagram of following 4 bit shift registers using D flip flops.	M4.03	
	a) Serial In Serial Out shift register		
	b) Serial In Parallel Out shift register		
	OR		
XIV.	Draw symbolic representation and write truth table of the following flip flops.	M4.02	R
	1) JK		
	2) SR		

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