



TED (21) -3044  
(Revision- 2021)

**N22-2110220227B**

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Reg.No.....  
Signature. ....

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

**DIGITAL ELECTRONICS**

(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.**

**(9x1=9 marks)**

		Module Outcome	Cognitive level
1	Hexadecimal value of decimal 21 is.....	M 1.01	U
2	Write the 1's complement of 1010	M 1.01	U
3	Write any one universal logic gate and show its symbol.	M1.03	R
4	Name the fastest logic family.	M2.02	U
5	Number of control signals required for a 4x1 Multiplexer is.....	M2.04	U
6	Name the type of logic circuit in which the output depends upon only the present input and present state.	M3.01	U
7	Serial in serial out shift register has.....input line and ..... output line.	M3.03	U
8	Counter without common clock is called.....counter.	M4.01	U
9	Name the memory which is also called volatile memory.	M4.04	R

**PART - B**

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

**(8x3=24marks)**

		Module Outcome	Cognitive level
1	Add the following Hexadecimal numbers. a) AC6 + 9B                      b) B59 + 64	M 1.01	U
2	Show the conversion of NAND gate to AND and NOT gates.	M 1.03	U
3	Reduce the expression $Y = \sum m(0,2,3,4,5)$ using K Map.	M1.04	A
4	Write any three features of TTL logic family.	M2.02	U
5	Show the functional diagram and logic diagram of logic circuit to select one data line at a time from two input data lines.	M2.04	A
6	Draw the logic of a 4 bit Ripple Carry Adder.	M2.04	U
7	Draw the logic symbol and truth table of T flip flop. Mention its applications.	M3.02	U
8	Draw the logic diagram of 3 bit ring counter using D flip flops.	M3.04	U



9	Write any three features of Asynchronous counter.	M4.01	U
10	Differentiate PROM, EPROM.	M4.04	U

### PART - C

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

**(6x7=42marks)**

		Module Outcome	Cognitive level
III	Perform the following operations. (i) Multiply $1011_2$ by $110_2$ (ii) 46-14 using 8 bit 2's complement method. (iii) Convert $2AB_{16}$ to binary.	M1.01	U
	<b>OR</b>		
IV	Minimize the following expression using K Map $F(A,B,C) = \sum m(1,4,7,10,13) + \sum d(5,14,15)$	M1.04	U
V	Using K Map design a 2 bit Gray to Binary code converter.	M2.04	U
	<b>OR</b>		
VI	Explain 3 line to 8 line Decoder using truth table only.	M2.04	U
VII	With the help of conversion table and K Map show the conversion of JK flip flop to T flip flop.	M3.02	A
	<b>OR</b>		
VIII	With necessary diagrams explain 3 bit Johnson counter using D flip flops.	M3.04	U
IX	Explain JK flip flop with logic diagram. Mention its truth table.	M3.02	U
	<b>OR</b>		
X	With a diagram explain the working of Serial in - Parallel out Shift register.	M3.03	U
XI	With the logic diagram and timing diagram briefly explain a two bit ripple up counter with positive edge triggering	M4.02	U
	<b>OR</b>		
XII	Write short notes on Random Access Memory.	M4.04	U
XIII	Design and implement a mode 6 Asynchronous counter using T flip flops.	M4.02	A
	<b>OR</b>		
XIV	Design a 3 bit synchronous up counter. (Excitation table and design equations need, no need to implement)	M4.03	A

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