Please check that this question paper contains 9 questions and 2 printed pages within first ten minutes.

[Total No. of Questions: 09]
Uni. Roll No. .....

[Total No. of Pages: .2...]

Program: B.Tech. (Batch 2018 onward)
Semester:.....3rd.....
Name of Subject: Digital Circuits and Logic Design
Subject Code: ...ESIT-101.....
Paper ID: ...16042....
Scientific calculator is Allowed

MORNING
09 MAY 2023

Time Allowed: 03 Hours **Max. Marks: 60**

NOTE:

1) Parts A and B are compulsory
2) Part-C has Two Questions Q8 and Q9. Both are compulsory, but with internal choice
3) Any missing data may be assumed appropriately

Part – A

[Marks: 02 each]

Q1.

Q1. a) What are ASCII codes.

b) What is the difference between Multiplexer and Demultiplexer.

c) Differentiate between Flip flop and Register.

d) Give the use of VHDL.

e) State and prove De Morgan's theorem.

f) Why NAND and NOR are called universal gates?

Part – B

[Marks: 04 each]

Q2) Why Gray codes are used in K-Maps. Explain in detail

Q3) Convert the following:

a) $(331)_8 = (\ )_{16} = (\ )_{10}$

b) $(11001010)_2 = (\ )_{\text{Gray code}}$

c) $(111)_2 = (\ )_{\text{BCD}}$

d) $(1101)_2 + (1110)_2 = (\ )_8$

P.T.O.

Q4) Simplify following expressions using Boolean algebra

a) F(P,Q,R)=P'Q+QR'+QR+PQ'R'

b) F(X,Y,Z)= X'Y'Z'+X'YZ'+X'YZ+XYZ'

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Q5) What is SOP and POS in digital circuits? Explain in detail.

Q6) Using Universal gates, create following gates

a) XOR b) AND

Q7) Design 2 bit Encoder and Decoder circuit

Part – C **[Marks: 12 each]**

Q8) Design 3 bit Synchronous Up Counter.

OR

Simplify the given K-Map

cd \ ab	00	01	11	10
00	1	X	X	1
01	X			1
11				
10	1			X

Q9) What are various techniques to convert Analog to Digital signals? Explain any one in detail.

OR

Demonstrate the working of Master Slave flip-flop in detail.

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