Total No. of Questions : 8] **SEAT No. :**

P-1530 **[Total No. of Pages : 3**

[6002]-159

S.E. (Computer Engineering)

DIGITAL ELECTRONICS AND LOGIC DESIGN

(2019 Pattern) (Semester - III) (210245)

Time : 2½ Hours] ***[Max. Marks : 70***

Instructions to the candidates:

1) ***Attempt Q1 or Q2, Q3 or Q4, Q5 or Q6, Q7 or Q8,***
2) ***Neat diagram must be drawn wherever necessary.***
3) ***Assume suitable data jf necessary.***

Q1) a) Distinguish between combinational and sequential switching circuits also write examples of both. **[6]**

b) Convert Following Flip flops: **[6]**

i) SR to T

ii) JK to D

c) What is MOD counter ? Design MOD 7 counter using IC 7490. **[6]**

OR

Q2) a) Draw and explain 3-bit asynchronous up-counter using JK flip flop. Also draw the necessary timing diagram. **[6]**

b) What do you mean by excitation table of flip flop? Write the excitation table of **[6]**

i) S-R flip flop

ii) J-K flip flop

c) With neat diagrams explain the working of the following types of shift registers **[6]**

i) Serial-in, serial-out

ii) Parallel-in, serial-out

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CEGP013091 49.248.216.238 20/06/2023 10:37:38 static-238

Q3) a) Draw the state diagram, state table and ASM chart for a 2-bit binary counter having one enable line E such that E = l counting enabled,and E = 0 counting disabled. **[6]**

b) Implement following Boolean function using PAL **[6]**

Fl = Σm (0,2,4,6,8,12)

F2 = Σm (2,3,8,9,12,13)

F3 = Σm (l,3,4,6,9,11,12,14,15)

c) Draw a block diagram of the PLA device and explain. **[5]**

OR

Q4) a) What is an ASM Chart? Name the elements of an ASM chart and define each of them. **[6]**

b) Implement BCD to Excess-3 code converter using PAL. **[6]**

c) What is the difference between PAL and PLA. **[5]**

Q5) a) With the help of a neat diagram, explain the working of two-input TTL NAND gate. **[6]**

b) Draw and explain the circuit diagram of CMOS inverter. **[6]**

c) Define the following terms and mention the standard values for TTL logic Family **[6]**

i) Fan-out

ii) Power Dissipation

iii) Propagation Delay.

OR

Q6) a) What is the advantage of open collector output? Justify your answer with suitable circuit. **[6]**

b) Compare TTL and CMOS logic family. **[6]**

c) What is logic family? Give the classification of logic family and also write important characteristics of .CMOS. **[6]**

CEGP013091 49.248.216.238 20/06/2023 10:37:38 static-238

Q7) a) Draw and explain the basic building of an ideal microprocessor based system with the help of neat diagram. **[6]**

b) What is system bus? Draw microprocessor bus structure and explain in brief. **[6]**

c) Write a short note on ALU IC 74181. **[5]**

OR

Q8) a) With the help of a block diagram explain the fundamental units of a microprocessor. **[6]**

b) Explain the Memory organization of the microprocessor. **[6]**

c) What is microprocessor? List different applications of microprocessor. **[5]**

CEGP013091 49.248.216.238 20/06/2023 10:37:38 static-238