Total No. of Questions : 8]

PC-4971

SEAT No. :

[Total No. of Pages : 2

[6352]-157R

S.E. (Computer Science and Engineering) (Data Science)

DIGITAL ELECTRONICS AND LOGIC DESIGN

(2019 Pattern) (Semester - III) (210644)

Time : 2½ Hours] *[Max. Marks : 70*

Instructions to the candidates :

1) *Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8.*
2) *Neat diagrams must be drawn wherever necessary.*
3) *Figures to the right indicate full marks.*
4) *Assume suitable data, if 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 JK

ii) JK to D

c) Draw and explain 4-bit asynchronous up-counter using JK flip flop. Also draw the necessary timing diagram. [6]

OR

Q2) a) What is MOD counter? Design MOD 7 counter using IC 7490. [6]

b) With neat diagrams explain the working of the following types of shift Registers [6]

i) Serial-in, serial-out

ii) Parallel-in, serial-out

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

i) SR flip flop

ii) J-K flip flop

Q3) a) Draw an ASM chart and state table of a 2 bit up-down counter having a mode control input. [6]

M = 1 Up counting M = 0 down counting

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

P.T.O.

c) Implement following Boolean function using PAL [5]

F1 = Σm (0, 2, 4, 6, 8, 12)

F2 = Σm (2, 3, 8, 9, 12, 13)

F3 = Σm (1, 3, 4, 6, 9, 11, 12, 14, 15)

OR

Q4) a) Draw a block diagram of the PLA device and explain. [6]

b) Implement BCD to Gray code converter using PAL. [6]

c) What is the difference between PAL and PLA? [5] 3

Q5) 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]

OR

Q6) a) Draw and explain the circuit diagram of CMOS inverter. [6]

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

i) Fan-out

ii) Power Dissipation

iii) Propagation Delay

c) With the help of a neat diagram. Explain the working of two-input TTL NAND gate. [6]

Q7) a) What is system bus? Draw microprocessor bus structure and explain in brief. [6]

b) Write a short note on following with respect to microprocessor. [6]

i) Address Bus

ii) Data Bus

iii) Control Bus

c) Explain the Memory organization of the microprocessor. [5]

OR

Q8) a) What is Microprocessor? List different applications of Microprocessor. [6]

b) Write a short note on ALU IC 74181. [6]

c) With the help of a block diagram explain the fundamental units of a Microprocessor. [5]

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