

Total No. of Questions : 8]

SEAT No. :

PE4272

[Total No. of Pages : 2

[6582]-44

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

Q1) a) Design and explain 2-bit Synchronous up counter using JK FlipFlop. Also draw necessary timing diagram. [6]

b) Convert the following FlipFlops: [6]

i) D to T

ii) JK to D

c) Explain types of shift registers & state any two applications. [6]

OR

Q2) a) Draw basic internal structure of decade counter IC 7490. Draw the diagram for MOD-26 counter using IC7490. [6]

b) Explain working of MS JK-FlipFlop. [6]

c) Draw & Explain Johnson counters with initial state "1010", from initial states explain all possible states. [6]

Q3) a) What is an ASM chart? Name the elements of an ASM chart. What is difference between ASM chart & conventional flow chart? [6]

b) Implement the following boolean function using PAL. [6]

$$I_1 = \sum m (0, 1, 2, 3, 5, 7, 8, 10, 15)$$

$$I_2 = \sum m (1, 2, 8, 12, 13)$$

c) What is difference between ROM, PAL & PLA. [5]

OR

P.T.O.

Q4) a) Draw the state diagram, state table & ASM chart for 3-bit binary UP counter having one enable E, such that. [6]

E = 1, counting enabled

E = 0, counting disabled

b) Implement the following function using PLA. [6]

$$F_1(A, B, C) = \sum m(1, 2, 4, 6)$$

$$F_2(A, B, C) = \sum m(0, 1, 6, 7)$$

c) Draw and explain the general structure of DLA. [5]

Q5) a) State the following characteristics of digital IC logic family TTL and CMOS: [6]

i) Noise margin

ii) Propagation delay

iii) Power dissipation

b) Draw & explain two input TTL NAND gate with active pull up. [6]

c) Draw & explain the circuit diagram CMOS-Inverter. [6]

OR

Q6) a) Explain tristate logic with respect to logic families. [6]

b) Give the classification of logic family also write voltage & current parameters of CMOS-logic family. [6]

c) Explain TTL open collector with neat diagram. [6]

Q7) a) Explain basic arithmetic operation using ALU IC 74181. [6]

b) What is microprocessor? List different applications of Microprocessor (any 4). [6]

c) Write a short note on with respect to Microprocessor. [5]

i) Address bus

ii) Control bus

OR

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

b) Explain memory organization of microprocessor in detail. [6]

c) Draw & explain 4 bit multiplier circuit using ALU & shift registers. [5]

