

SPPU-SE-COMP-CONTENT – KSKA Git

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 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 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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SPPU-SE-COMP-CONTENT – KSKA Git

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 = 1 counting enabled, and E = 0 counting disabled. [6]

b) Implement following Boolean function using PAL [6]

$$F1 = \sum m (0,2,4,6,8,12)$$

$$F2 = \sum m (2,3,8,9,12,13)$$

$$F3 = \sum m (1,3,4,6,9,11,12,14,15)$$

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]

SPPU-SE-COMP-CONTENT – KSKA Git

- 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]

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