7. (a) Discuss the various specifications of a DAC Converter? With a neat circuit diagram explain the working of a Weighted resistor type Digital to Analog Converter. CO3 (10)

(b) Write a short note on semiconductor memories. CO4 (5)

Roll No. .... Total Pages : 4

007403

May 2023

B.Tech. (EL) IV SEMESTER

DIGITAL ELECTRONICS (ELPC401)

Time : 3 Hours] [Max. Marks : 75

Instructions :

1. *It is compulsory to answer all the questions (1.5 marks each) of Part-A in short.*
2. *Answer any four questions from Part-B in detail.*
3. *Different sub-parts of a question are to be attempted adjacent to each other.*

PART–A

1. (a) What is the difference between a synchronous and a asynchronous counter? CO2 (1.5)

(b) Differentiate between PLA and PAL. CO4 (1.5)

(c) What are the various types of clocks in sequential circuits? CO2 (1.5)

(d) What is the resolution in volts of a 10-bit D/A Converter whose fullscale output is 5V? CO3 (1.5)

(e) Which of the digital logic families is the fastest among all? CO1 (1.5)

(f) Display the decimal numbers (97 and 19) in Excess-3 code. CO1 (1.5)

(g) What do you understand by the problem of current hogging? CO1 (1.5)

(h) What is the significance of ASCII code? CO1 (1.5)

(i) Perform (20-42) using l's complement method. CO1 (1.5)

(j) What is a race around condition? CO2 (1.5)

PART–B

2. (a) Perform the following conversions: CO1 (5)

(i) $(49056)_{10} = (?)_{16}$.

(ii) $(10101)_2 = (?)_{10}$.

(iii) $(2AB)_{16} = (?)_8$.

(iv) $(C20)_{16} = (?)_2$.

(v) $(287)_{10} = (?)_8$.

(b) Encode data bits 0011 into the 7-bit even parity Hamming code. CO1 (5)

(c) Discuss the working of a parallel-in serial-out (PISO) register in detail. CO2 (5)

3. (a) Reduce the expression F(A, B, C, D) = Σm (0, 1, 2, 3, 5, 7, 8, 9, 10, 12, 13) using K-map and implement using NAND gates only. CO2 (7.5)

(b) With a neat circuit diagram explain the operation of a Counter type A/D converter. CO2 (7.5)

4. (a) Explain the following terms : CO1 (5)

(i) Fan in.

(ii) Figure of merit.

(iii) Propagation delay.

(iv) Tristate logic.

(v) Passive pull up.

(b) Implement following Boolean function using a 8 : 1 multiplexer.

F(A, B, C, D) = Σm(0, 1, 3, 4, 5, 8, 9, 15). CO2 (5)

(c) Design a combinational circuit for a common anode display BCD to 7 segment code converter. (for any one segment) CO2 (5)

5. (a) Design a 4-bit BCD to gray code converter using logic gates. CO2 (7.5)

(b) Carry out the conversion of S-R Flip-Flop to J-K Flip-Flop CO2 (7.5)

6. (a) Explain the working of TTL logic family with active pull up configuration with suitable diagrams and truth table. CO1 (7.5)

(b) Design and implement a Mod-5 up/down counter using JK-Flip-Flop. CO2 (7.5)