

6. (a) What is an ASM chart ? Briefly discuss components of ASM chart. 7

- (b) Draw the ASM chart for sequence detector to detect the sequences 1011 and 1101. It generates output 1 when sequence is detected. Overlapping is not permitted. 8

Unit IV

7. (a) Explain working of a two-input TTL NAND gate with the help of circuit diagram. 7

- (b) Explain working of 2-input CMOS NAND gate. What is the advantage of active load ? 8

8. (a) Explain need of using PLDs in digital system design. 4

- (b) Compare CPLD and FPGA. 4

- (c) Design and implement full adder circuit using PLA. 7

18C3

B.Tech. EXAMINATION, 2024

(3rd Semester)

(C Scheme) (Main & Re-appear)

(CSE, ECE)

ECE203C

DIGITAL SYSTEM DESIGN

Time : 3 Hours]

[Maximum Marks : 100

Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

Note : Attempt *Five* questions in all, selecting *one* question from each Unit. Q. No. 9 is compulsory. All questions carry equal marks.

Unit I

1. (a) Simplify following expression using Boolean algebra : 4

$$F = (\bar{A} + B)(A + B + D)\bar{D}$$

- (b) Realize XOR function using NAND logic. 4

- (c) Minimize the following expression using K-map and realize using NOR Gates : 7

$$F = \prod M(1, 2, 3, 8, 9, 10, 11, 14) * d(7, 15)$$

2. (a) Reduce the following expression using 3-variable Map : 7

$$F = \bar{A} + \bar{B} + \bar{C} + \bar{A}BC + \bar{A}BCF + \bar{A}BC\bar{C} + \bar{A}BCD + \bar{A}BC\bar{F}$$

- (b) Design and implement 4-bit Gray to Binary code converter using suitable logic gates. 8

Unit II

3. (a) Implement a full subtractor using two 4 : 1 multiplexers. 7

- (b) Design a BCD adder using 4-bit binary adder. 8

4. (a) Draw the circuit diagram for J-K flip flop using NAND Gates. Give its truth table and explain race around condition. 7

- (b) Discuss applications of shift registers. 8

Unit III

5. (a) Design a 3-bit odd parity generator using J-K flip flops. 7

- (b) Design a sequence detector to detect the non-overlapping sequences 1011 and 1101. It generates output 1 when sequence is detected. 8

Compulsory Question :

9. Explain the following terms : 15

- (a) Canonical forms
- (b) Parallel adder
- (c) Edge-triggered FF
- (d) Serial binary adder
- (e) Interfacing of different logic families

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