

B.Tech II Year I Semester (R13) Supplementary Examinations June 2017

DIGITAL LOGIC DESIGN

(Common to CSE & IT)

Time: 3 hours

Max. Marks: 70

PART – A

(Compulsory Question)

1 Answer the following: (10 X 02 = 20 Marks)

- Reduce $AB + (AC)' + AB'C (AB + C)$.
- Simplify the following expression $Y = (A + B)(A + C')(B' + C')$.
- Define K-map? Name its advantages and disadvantages.
- Write about universal logic gates and realize XOR gate using Universal gates.
- Construct full adder using half adders.
- Compare a decoder with a Demultiplexer.
- What is race around condition?
- Write about bidirectional shift register.
- List basic types of programmable logic devices.
- Explain about parallel in serial out shift register.

PART – B

(Answer all five units, 5 X 10 = 50 Marks)

UNIT – I

- Convert 1A53 Hexadecimal to its decimal equivalent.
 - Convert $(734)_8$ to its hexadecimal equivalent.
 - Convert 0.640625 decimal number to its octal equivalent.
 - Convert 0.1289062 decimal number to its hex equivalent.

OR

3 Prove the following identities:

- $A' B' C' + A' B C' + A B' C' + A B C' = C'$.
- $A B + A B C + A' B + A B' C = B + A C$.

UNIT – II

4 A combinational circuit has 3 inputs A, B, C and output F. F is true for following input combinations
a) A is False b) A, B, C are True

- Write the Truth table for F. Use the convention True = 1 and False = 0.
- Write the simplified expression for F in SOP form.
- Write the simplified expression for F in POS form.
- Draw logic circuit using minimum number of 2-input NAND gates.

OR

5 Simplify the following expression into sum of products using Karnaugh map:

$$F(A, B, C, D) = \sum(1, 3, 4, 5, 6, 7, 9, 12, 13)$$

UNIT – III

6 Draw and explain the working of a carry-look ahead adder.

OR

- Design a 4-bit adder-subtractor circuit and explain the operation in detail.
 - Explain the functionality of a decoder.

Contd. in page 2

UNIT – IV

8 Construct a JK flip-flop using a D flip-flop, a two-to-one-line multiplexer, and an inverter.

OR

9 Define a register. Construct a shift register from S-R flip-flops. Explain its working.

UNIT – V

10 (a) Compare PLA with PROM.

(b) What is ROM? List the different types of ROMs.

OR

11 Write about the following:

(a) CMOS logic.

(b) Digital logic circuits.

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