

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

- 2
- 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

- 7
- Design a 4-bit adder-subtractor circuit and explain the operation in detail.
 - Explain the functionality of a decoder.

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.
