

67003

**MCA 1st Semester (Old) only for
Re-appear Candidates
Examination-December, 2013**

Digital Design

Paper MCA-103

Time : 3 hours

Max. Marks : 75

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

Note : Attempt any **five** questions in all selecting at least **one** question from each Unit. All questions carry equal marks.

UNIT - I

1. (a) If $A = -60$ and $B = -28$

- (i) Represent A and B in 8-bit 2's complement form.

(ii) Find $A + B$

(iii) Find $B - A$.

(b) What is Excess-3 code ? Explain the significance of ASCII code.

2. (a) Explain the signed binary number representation.

(b) What is hamming code ? What is its utility ?

(c) Write a short note on BCD code.

UNIT - II

3. (a) Classify various MOS family. Compare Bipolar and MOS devices.

(b) Minimize the function using K-map and design its output by NAND gates only

$$Y = \sum m(0, 1, 3, 7, 10, 14)$$

4. (a) What is Boolean algebra ? What is its utility ?
- (b) What are three important laws of Boolean algebra ? Explain them with their statements and Gate implementation.

UNIT - III

5. (a) What is the basic architecture of a PLA ? How is the capacity of a PLA specified ? How it is programmed ? Explain.
- (b) Convert a JK Flip-flop into T type flip flop.
6. (a) Design the circuit of full subtractor using 8 : 1 multiplexer.
- (b) Write a short note on Magnitude Comparator.

UNIT - IV

7. (a) Design a MOD-6 Ripple counter.
- (b) Differentiate between Static RAM and Dynamic RAM.
8. Write short notes on the following :
- (i) Shift Registers
 - (ii) Architecture of RAM.