9. (a) What is Ripple Counter ? Discuss about the propagation delay in Ripple Counters. 8

(b) Compare and contrast Static RAM and Dynamic RAM. 8

Roll No. .....

67008

MCA 1st Semester (Current)
CBCS Scheme w.e.f. 2016-17
Examination – December, 2018

DIGITAL DESIGN

Paper : 16MCA-31C3

Time : Three Hours] *[Maximum Marks : 80*

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 examination.

Note : Attempt ***five*** questions in all. Question No. **1** is ***compulsory***. In addition to compulsory question, attempt ***four*** more questions selecting ***one*** question from each Unit.

1. Write short answer to the following : $8 \times 2 = 16$

(a) What is the effect of single left shift operation on a binary number ?

(b) What is the full form of ASCII and EBCDIC in terms of codes ?

(c) Write the Truth Table for F(X,Y,Z) = X+Y.Z

(d) Build a device that behaves like an OR gate from AND and NOT gates.

(e) Draw the diagram of a half adder circuit.

(f) What is a flip flop ? What is the memory storage capacity of a flip flop ?

(g) What is use of Counters in digital electronics ?

(h) Name the register(s) used to provide time delays.

UNIT – I

2. (a) Encode the decimal digits 0, 1, 2, ... 9 by means of weighted codes 3321 and 731-2. 10

(b) What are Hamming codes ? How is the Hamming code word tested and corrected ? 6

3. (a) What are Gray codes ? What are they used for ? Are Gray codes useful for mathematical operations ? 6

(b) Encode data bits 0011 into the 7-bit even parity Hamming code. 6

(c) Convert $(C20)_{16} = (?)_2$. 4

UNIT – II

4. (a) Explain the significance of De Morgan's Law of Boolean algebra. 4

(b) Minimize the following multiple output functions : 12

(i) $f_1 = \Sigma m\ (0, 2, 6, 10, 11, 12, 13) + d(3, 4, 5, 14, 15)$

(ii) $f_2 = \Sigma m(1, 2, 6, 7, 8, 13, 14, 15) + d(3, 5, 12)$

5. (a) Reduce the expression : (A+ (BC)')'(AB' + ABC) 4

(b) Without reducing, implement (1 + A)(ABC) expression to NAND logic. 4

(c) Reduce using K-map the expression π M(2, 8, 9, 10, 11, 12, 14) and implement it in Universal logic. 8

UNIT – III

6. (a) Design a Full Adder circuit using only two-input NAND gates. 6

(b) What are flip-flops ? What are the uses flip-flop ? Discuss the working of a J-K flip-flop. 10

7. (a) How S-R flip-flop can be converted to J-K flip-flop ? 4

(b) Differentiate between MUX and DEMUX. Draw a basic 2-input Multiplexer circuit. 6

(c) Define the following : 6

(i) Hold time

(ii) Setup time

UNIT – IV

8. (a) Write short notes on the following : 8

(i) Buffer register

(ii) Static shift register

(b) Differentiate between Ripple counter and Synchronous counter. 8