Department of Electronics and Communication Engineering

M.M.M. University of Technology, Gorakhpur

DE & CO

BEC-201

Assignment 2

Part-1

1. Define and difference between combinational and sequential logic circuits.

2. Explain the design procedure for combinational logic circuits by using truth table and diagram.

3. Define half adder and full adder. Design half adder and full adder using only NAND and NOR gates.

4. Draw and explain the block diagram of n-bit parallel adder.

5. What do you mean by carry propagation delay?

6. Explain the procedure for Excess-3 addition.

7. What is the decoder and encoder? Explain with the help of block diagram and examples.

8. What is multiplexer and demultiplexer? Draw the logic diagram of 8 to 1 line multiplexer.

9. Write a short note on priority encoder. Define code converter.

10. Implement the full adder with a decoder circuit.

11. Implement function using MUX

$$F(A, B, C) = \Sigma (1,2,5,7)$$

12. Implement the following function

$$F(A, B, C, D) = \Sigma m (0,1, 3, 4, 7, 8, 9, 11, 14, 15) \text{ using}$$

a) 16:1   b) 8:1   d) 4:1   d) 2:1

13. 1, implement the following function using 8: 1 MUX.

(a) $F(A, B, C, D) = Em(0, 1, 4, 8, 12, 14, 15)$

14. Implement the following function using 8: 1 MUX.

(a) $F(A, B, C, D) = Im(0, 3, 4, 7, 8, 11) + d(2, 10, 12)$

15. Design a combinaitonal circuit whose output is equal to 1 if the input variables have more 1's than 0's. The output is O otherwise.

16. Design a code converter that converts a decimal digit from the 8-4-2-1 code.

Part-2

1. Differentiate between latch and Flip flops.

2. Define Flip flops. What are the various types of flip flops? Sketch the logic diagram of a clocked SR flip flop.

3. What is a D flip flop? Write the truth table of JK flip flop.

4. What are the advantages of JK flip flop over an SR flip flop? What is the difference between positive and negative edge triggering?

5. What is the difference between truth table and excitation table.

6. List the basic flip flop applications.

7. Why do we use master slave flip fop over JK flip fop?

8. Define characteristic equation of flip flops.

9. What is counter? Draw and explain logic diagram of a 4 bit binary ripple counter