**Mandan Bhandari Memorial College**

**Subject: Digital Logic Department: CsIT Exam time: 3 hours**

**Full marks: 60**

**Pass marks: 24**

1. Subtract the following using 9’s complement. (2 marks)

7253210 - 325010

1. Convert the following. (1.5 \* 2 = 3 marks)
2. (10110)2 = (?)Gray b. (1573)8 = (?)16
3. How to find the complement of a given function? Explain with examples. (4 marks)
4. Prove the given Boolean function.(2 marks)

A’BC + AB’C + ABC’ + ABC = AB + BC + CA

1. What do you mean by universal gate? Show that NAND and NOR are universal gate. (5 marks)
2. Use K-map to simplify the given function in POS. Implement the simplified function using 2-input NOR gate only. (5 marks)

F = π M(0,1,2,9,10,11,14) and with don’t care conditions

D = π M(7,8,12)

1. Design an odd parity generator and parity checker for 3-bit input system. (5 marks)
2. Design and Explain 4-bit Adder-Subtractor.(5 marks)
3. Design a priority encoder and explain why we need it over encoder. (5 marks)
4. Design a circuit that produces the square of the three bit number using ROM. (4 marks)

**Attempt any two (2\*10 = 20)**

1. Design a BCD adder that adds up two decimal number.
2. Design a BCD to Excess-3 code converter.
3. Implement the following function F=∑(0,1,3,4,7) using
4. Decoder
5. Multiplexer
6. PLA