Assessment 4

Experiment 5 Binary Parallel Adder and Magnitude Comparator:

1. Design a 4 bit Binary parallel Adder.
2. Design Excess 5 to BCD using Binary parallel adder
3. Design a 2-bit magnitude comparator.
4. Design a circuit to determine the greatest of 3 2-bit numbers using a 2 bit magnitude comparator.

Experiment 6 Decoder and Multiplexer

1. To design 2 to 4 line decoder.
2. Design a logic circuit to control the traffic light as per the given details. Vehicle detection sensors are placed along C and D (main road) and lanes A and B (access road). These sensor outputs are LOW (0) when no vehicle is present and HIGH (1) when a vehicle is present. The intersection traffic light is to be controlled according to the following logic:

a. The east-west (E-W) traffic light will be green whenever both lanes C and D are occupied. b. The E- W light will be green whenever either C or D is occupied but lanes A or B are not occupied. c. The north-south (N-S) light will be green whenever both lanes A and B are occupied but C or D are not occupied. d.The N-S light will also be green when either A or B is occupied while C and D are both vacant.

e. The E-W light will be green when no vehicles are present. Using the sensor outputs A, B, C and D as inputs, N-S and E-W be two outputs that go high when the corresponding light to be green. Simulate the above scenario using decoders.

1. Show how two 4-to-1 and one 2-to-1 multiplexers could be connected to form an 8-to-1 MUX with three control inputs.
2. Design a 4-bit Even parity Checker using a multiplexer.