Name: Id#

COE 202, Term 112

Digital Logic Design

Quiz# 4

Date: Saturday, April 7

# 

# **Q1**.

1. Determine the decimal value of the 8-bit binary number (11010100) when interpreted as:

|  |  |  |  |
| --- | --- | --- | --- |
| An unsigned number | A signed-magnitude number | A signed-1’s complement number | A signed-2’s complement number |
|  |  |  |  |

ii. Represent the decimal value (- 40) in binary using a total of 8 bits in the following notations:

|  |  |  |
| --- | --- | --- |
| A signed-magnitude number | A signed-1’s complement number | A signed-2’s complement number |
|  |  |  |

iii. Perform the following signed-2’s complement arithmetic operations in binary using 5 bits. All numbers given are represented in the signed-2’s complement notation. Indicate clearly the carry values from the last two stages. For each of the three operations, check and indicate whether overflow occurred or not.

|  |  |  |  |
| --- | --- | --- | --- |
|  | a. 01001  +10111 | b. 01000  - 10010 | c. 11010  - 01101 |
| Overflow Occurred? (Yes/No) |  |  |  |

**Q2**. Design a combinational circuit that receives a 4-bit unsigned number **I= I3I2I1I0** as input and generates the remainder of dividing this number by 3.