**Bennett University**

**(SCSET)**

**Mid Sem Examination**

**CSET105**

**Digital Design**

Max marks: 20 Max Time: 1:00 Hr.

**Note: Q1 to Q7 has 2 Marks each and Q8 & Q9 have 3 marks.**

**Q1.** Each of the following number is a signed number. Determine the decimal value in each case, if they are in (1) Sign Magnitude form (2) 2’s complement form (3) 1’s complement form

1. 10111
2. 1101010

**Q2.** Subtract 27.50 from 68.75 using 12 bit 1’s Complement arithmetic.

**Q3.** Each of the following Arithmetic operations is correct in at least one number system. Determine the possible base (Radix) in each operation.

1. 23 + 44 +14 +32 = 223

**Q4.** Perform decimal addition of 679.6 and 536.8 using BCD code.

**Q5.** Convert the following into the gray number.

**Q6.** A Combination of multiplexers is given, Express the output Y.

Diagram

Description automatically generated

**Q7.** The following diagram resembles one of the combinational circuits, so calculate the output expression S and C and mention the name of circuit.

Diagram, schematic

Description automatically generated

**Q7.** Implement the logic expression with 4:1 Multiplexer (Draw Multiplexer)

1. Choose (A B) as Select line
2. Choose (A C) as select line

**Q8.** The following truth table is given for the outputs (Z) and (Y).

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Inputs** | | | | **Output** | **Output** |
| **A** | **B** | **C** | **D** | **Z** | **Y** |
| 0 | 0 | 0 | 0 | X | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 |
| 0 | 0 | 1 | 0 | X | 0 |
| 0 | 0 | 1 | 1 | 1 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 |
| 0 | 1 | 0 | 1 | 1 | 0 |
| 0 | 1 | 1 | 0 | 1 | 0 |
| 0 | 1 | 1 | 1 | 1 | 1 |
| 1 | 0 | 0 | 0 | 1 | 1 |
| 1 | 0 | 0 | 1 | 0 | 1 |
| 1 | 0 | 1 | 0 | X | X |
| 1 | 0 | 1 | 1 | 0 | X |
| 1 | 1 | 0 | 0 | 0 | X |
| 1 | 1 | 0 | 1 | 1 | X |
| 1 | 1 | 1 | 0 | 0 | X |
| 1 | 1 | 1 | 1 | 1 | X |

Obtained Minimized Boolean expression of Z and Y by using K-map with considering the don’t care conditions.