

**Course Code: SE 213; Course Title: Digital Electronics & Logic design**  
**Batch: 40 & 38; Sections: All**

**Marks: 25**

*[The figures in the right margin indicate the full marks and corresponding course outcomes. All portions of each question must be answered sequentially.]*

|   |    |                                                                                                                                                                                                                                                                                                                          |             |                  |
|---|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|------------------|
| 1 | a) | Develop the truth table and circuit diagram of the following Function<br>$F = xy(y' + z) + x'z'$                                                                                                                                                                                                                         | [Marks-4]   | CLO-1<br>Level-3 |
|   | b) | Utilize 2's complement method to Subtract the binary numbers<br>$101101 - 110011$                                                                                                                                                                                                                                        | [Marks-3]   |                  |
|   | c) | Explain why the NOR gate is referred to as a universal gate.                                                                                                                                                                                                                                                             | [Marks-3]   |                  |
| 2 | a) | $Y = BC + AC' + AB + BCD$<br><div style="display: flex; justify-content: space-around; width: 100%;"> <span>1 1</span> <span>1 0</span> <span>1 1</span> <span>1 1 1</span> </div> <p>Apply k-map simplification technique to simplify the above expressions. Construct the logic diagrams of the simplified output.</p> | [Marks-4+3] | CLO-2<br>Level-3 |
|   | b) | Check the following function. Interpret in sum of minterms & convert it to product of maxterms form.<br>$F(W, X, Y, Z) = Z(W' + X) + X'Z$                                                                                                                                                                                | [Marks-8]   |                  |

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