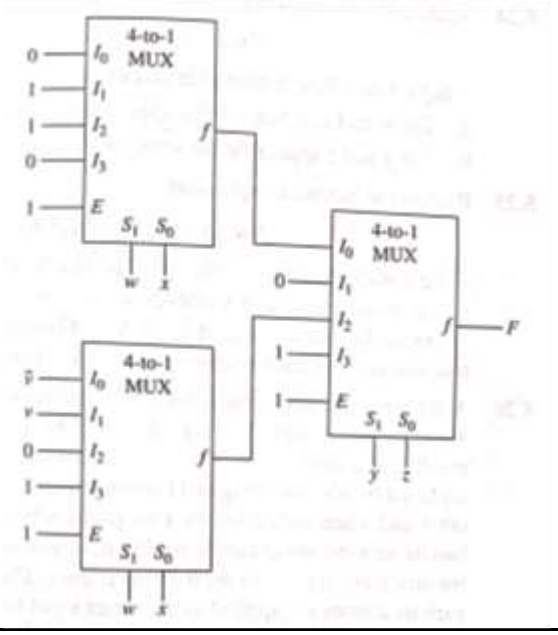
ICT 2154 Digital Systems / ICT 2171 Digital Systems and Computer Organization

Note: Students are required to submit handwritten assignment in A4 Sheet on or before 2pm, 5th November 2022. Design should use minimum number of components/gates

<table>
<tr><th>Q. No.</th><th>Questions</th></tr>
<tr><td>1.</td><td>Design 2 – bit X 2 – bit binary multiplier using 74138ICs and minimum universal gates.</td></tr>
<tr><td>2.</td><td>Design 2 – bit magnitude comparator using active high output decoders and minimum universal gates.</td></tr>
<tr><td>3.</td><td>Implement the function F= (A’BD + AB’C’+ A) using decoders and minimum external gates.</td></tr>
<tr><td>4.</td><td>Design a 3-bit subtractor using 74153 ICs and external gates</td></tr>
<tr><td>5.</td><td>Write the function (minterms) realized using following circuit.
 
</td></tr>
<tr><td>6.</td><td>Design a BCD adder to add two single digit decimal numbers represented in excess-3 code. The result should also be in excess-3 code form.</td></tr>
<tr><td>7.</td><td>Design a code converter that converts a decimal digit from 8 4 –2 –1 code to BCD.</td></tr>
<tr><td>8.</td><td>Using truth table and K-maps design the BCD to seven segment decoder using minimum number of gates. The six invalid combinations should result in a blank display.</td></tr>
<tr><td>9.</td><td>Design a XY flip flop using NAND latch and EXTERNAL gates according to the truth table given below.
<table>
<tr><th>X</th><th>Y</th><th>OUTPUT</th></tr>
<tr><td>0</td><td>0</td><td>toggle</td></tr>
<tr><td>0</td><td>1</td><td>set</td></tr>
</table></td></tr>
</table>

	1	0	reset	
	1	1	Same as previous output	
10	Convert the SR flip flop to XY flip flop. Truth table of XY flip flop is given in question 9.			