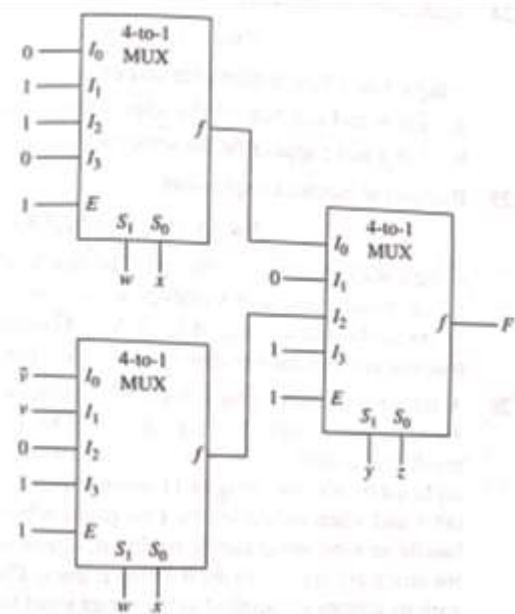# ICT 2154 Digital Systems / ICT 2171 Digital Systems and Computer Organization

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

Q. No.	Questions
1.	Design 2 – bit X 2 – bit binary multiplier using 74138ICs and minimum universal gates.
2.	Design 2 – bit magnitude comparator using active high output decoders and minimum universal gates.
3.	Implement the function F= (A'BD + AB'C'+ A) using decoders and minimum external gates.
4.	Design a 3-bit subtractor using 74153 ICs and external gates
5.	Write the function (minterms) realized using following circuit.
6.	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.
7.	Design a code converter that converts a decimal digit from 8 4 −2 −1 code to BCD.
8.	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.
9.	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>

	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.			