

Infolink University College – Hawassa Campus

Department of Computer Science 2nd Year

Assignment on Digital Logic Design

Part I - Using the Boolean expressions given below, do the following:

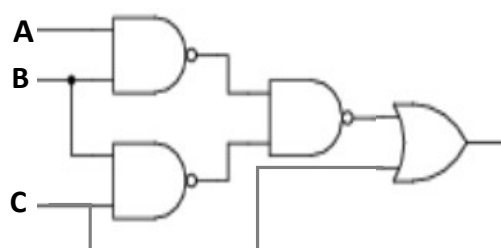
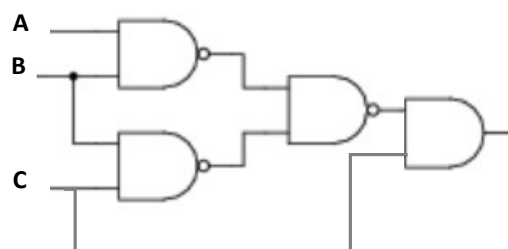
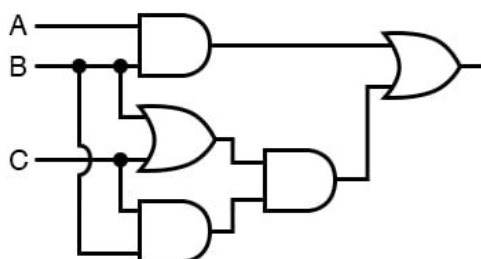
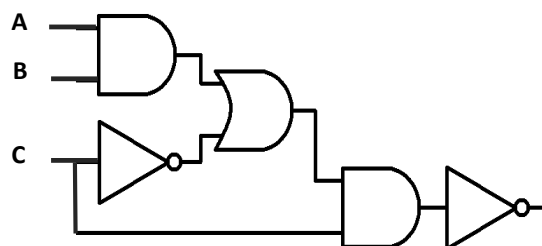
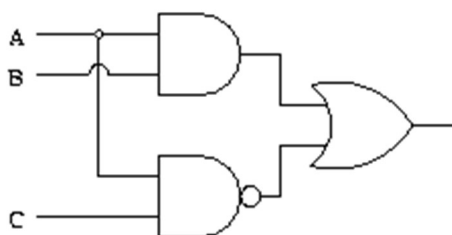
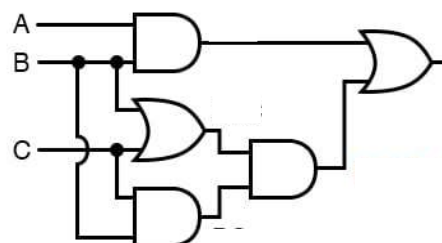
- a. Draw the logic diagram
 - b. Show the truth table
 - c. Simplify the expression using simplification rules
 - d. Draw the simplified Boolean expression
 - e. Show the truth table of the simplified Boolean expression
1. $\bar{X}.Y.Z + X.\bar{Y}.Z + X.Y.\bar{Z} + X.Y.Z$
 2. $(\bar{X} + XY).(\bar{X}\bar{Y} + X)$
 3. $XY + X(Y+Z) + Y(Y+Z)$
 4. $XY' + X(\bar{Y} + \bar{Z}) + Y(\bar{Y} + \bar{Z})$
 5. $(X\bar{Y}.(\bar{Z} + \bar{X}.W) + \bar{X}\bar{Y}).XW$
 6. $XY + \bar{X}\bar{Z} + X\bar{Y}Z(XY+Z)$

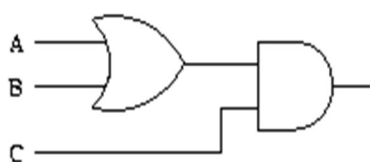
Part II - Apply DeMorgan's Theorems with other rules and simplify that following expressions. Show all the steps mentioning the rules used for each step.

1. $\overline{(AB + A) + (AB)}$
2. $\overline{(A + B) + (A.B)}$
3. $\overline{(A')} + \overline{(A'.B)}$
4. $\overline{(A + B).(AB + B)}$
5. $\overline{(A'B + A'B')} . \overline{(AB)}$
6. $\overline{(A' + B) + (A.B')}$
7. $\overline{(AB)'} . \overline{(A' + B')}$
8. $\overline{(A'.B).(A + B)}$
9. $\overline{(A' + B)'} . \overline{(AB + B')}$
10. $\overline{(A.B' + AB)'} . \overline{(A + B)'} .$
11. $\overline{(AB + A'B)} . \overline{(AB)}$
12. $\overline{(AB)} . \overline{(A.B' + AB)'} .$

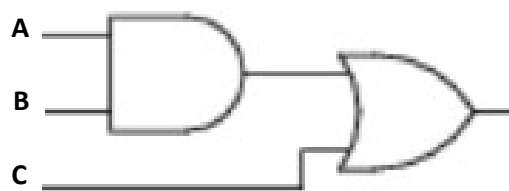
Part III - Using the logic diagrams given below

- Write the Boolean expression of the diagram
- Show the truth table
- Simplify the expression using simplification rules
- Draw the logic diagram of the simplified Boolean expression
- Show the truth table of the simplified Boolean expression

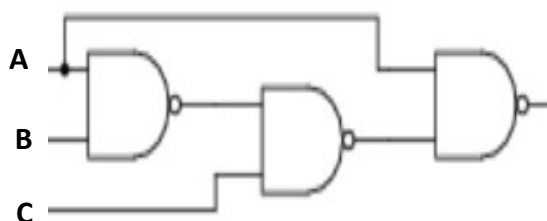
**#1****#2****#3****#4****#5****#6**



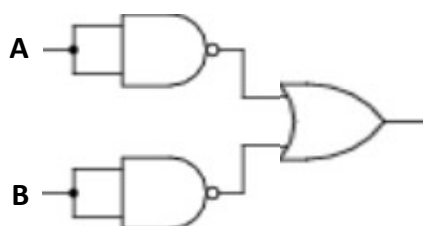
#7



#8



#9



#10

Group No.	Questions to be done by each group from each part		
	Part I	Part II	Part III
Group -1	#1	1, 12	#6, #8
Group -2	#2	2, 7	#5, #9
Group -3	#3	3, 5	#4, #7
Group -4	#4	4, 11	#3, #10
Group -5	#5	6, 9	#2, #3
Group -6	#6	8, 10	#1, #6

Assignment Submission

- Format:** Neatly hand written
- Submission Deadline:** before or on **17/05/15 EC** morning up to **5:30 LT**