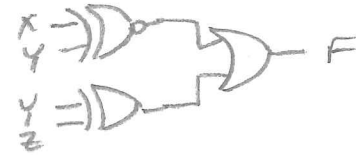
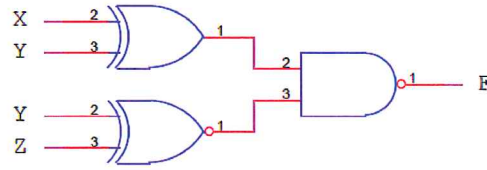


**LEARNING OUTCOME #2: "an ability to analyze and design combinational logic circuits."**

1. B
2. C
3. D
4. A
5. D
6. C
7. A
8. D
9. A
10. B
11. B
12. B
13. D
14. D
15. B
16. B
17. C
18. A
19. C
20. E
21. C
22. C
23. C
24. C
25. C
26. D
27. C
28. C
29. D
30. C

Circuit for questions 9 & 10:

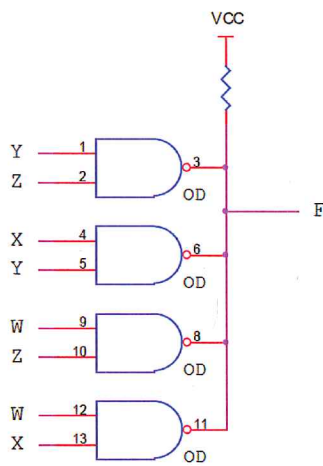


$$F = X'Y' + XY + YZ' + Y'Z$$

	X'	X	
Z'	1	2	6
Z	1	3	7
	Y'	Y	Y'

$$\Pi_{X,Y,Z}(3,4)$$

Circuit for questions 12 & 13:



$$F' = X'YZ + XY'Z' \Rightarrow F = (X+Y'+Z') \cdot (X'+Y+Z)$$

COST = 11

$$F' = YZ + XY + WZ + WX$$

	W'	W	
Y'	1	1	0
Y	1	1	0
	X'	X	X'

$$F = W'Y' + X'Z'$$

$$F = (Y'+Z') \cdot (X'+Y')$$

$$\cdot (W'+Z') \cdot (W'+X')$$

Timing diagram for questions 15 & 16:

