Doon Public School

A Senior Secondary School
Sector- 21, Panchkula. Ph: 0172- 2590514

Assignment– 5 **Subject: Computer Science** **Class: XI**

Date: 10-10-2018

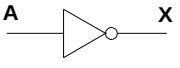
INSTRUCTIONS:

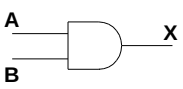
- **Do the given assignment in your assignment note book.**

For Exercises 1- 17, mark the answers true and false as follows:

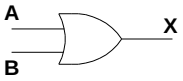
1. Logic diagrams and truth tables are equally powerful in expressing the processing of gates and circuits.
2. Boolean expressions are more powerful than logic diagrams in expressing the processing of gates and circuits.
3. A NOT gate accepts two inputs.
4. The output value of an AND gate when both inputs are 1 is 1.
5. The AND and OR gates produce opposite results for the same input
6. The output value of an OR gate when both inputs are 1 is 1.
7. The output of an OR gate when one input is 0 and one input is 1 is 0.
8. The output value of an XOR gate is 0 unless both inputs are 1.
9. The NOR gate produces the opposite results of the XOR gate.
10. A gate can be designed to accept more than two inputs.
11. A transistor is made of semiconductor material.
12. Inverting the output of an AND gate is equivalent to inverting the individual signals first, then passing them through an OR gate.
13. The sum of two binary digits (ignoring the carry) is expressed by an AND gate.
14. A full adder takes the carry-in value into account.
15. A multiplexer adds all of the bits on its input lines to produce its output.
16. Integrated circuits are classified by the number of gates contained in them.
17. A CPU is an integrated circuit.

For Exercises 18 - 29, match the gate with the diagram or description of the operation.
A. AND
B. NAND
C. XOR
D. OR
E. NOR
F. NOT

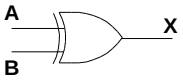
18. Inverts its input.
19. Produces a 1 only if all its inputs are 1 and a 0 otherwise.
20. Produces a 0 only if all its inputs are 0 and a 1 otherwise.
21. Produces a 0 only of its inputs are the same and a 1 otherwise.
22. Produces a 0 of all its inputs are all 1 and a 1 otherwise.
23. Produces a 1 if all its inputs are 0 and a 0 otherwise.
24. 

25. 

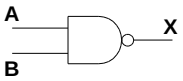
26.



27.



28.



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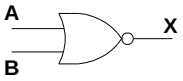

Exercises 30 - 40 are short answer or design questions.

30. Distinguish between a gate and a circuit.
31. What are the three notational methods for describing the behavior of gates and circuits?
32. Characterize the notations asked for in Exercise 32.
33. How many input signals can a gate receive and output signals can a gate produce?
34. Name six types of gates.
35. Give the three representations of a NOT gate and say in words what NOT means.
36. Draw a circuit diagram corresponding to the following Boolean expression:
    (A + B)(B + C)

37. Draw a circuit diagram corresponding to the following Boolean expression:
    (AB + C)D

38. Draw a circuit diagram corresponding to the following Boolean expression:
    A'B + (B+C)'

39. Draw a circuit diagram corresponding to the following Boolean expression:
    (AB)' + (CD)'

40. Show the behavior of the following circuit with a truth table: