1. An AND gate gives output 1 when:

   ☐ at least one input is 1

   ☐ the inputs are different

   ☐ both inputs are 1

   ☐ both inputs are 0

2. The expression ‘(A AND B) OR (NOT C)‘ means:

   ☐ do A AND B, do NOT C, then OR the two results

   ☐ do A AND B AND C, ignoring the OR and NOT

   ☐ invert A, B and C first, then AND them together

   ☐ do A OR B only, then ignore the NOT C part

3. An OR gate gives output 0 only when:

   ☐ both inputs are 0

   ☐ one input is 1

   ☐ both inputs are 1

   ☐ the inputs are different

4. How many rows does a truth table have for a circuit with 3 inputs?

   _____

5. A XOR gate gives output 1 when:

   ☐ both inputs are 0 at the same time

   ☐ both inputs are 1 at the same time

   ☐ at all times, whatever the inputs are

   ☐ the two inputs are different

6. When drawing a circuit from a problem statement, you should:

   ☐ always reduce it to as few gates as possible, ideally one

   ☐ ignore the NOT operations, since they only invert a signal

   ☐ add extra gates so that every input is checked twice

   ☐ draw it exactly as the statement says, without simplifying

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8. How many rows does a truth table for a circuit with 4 inputs need?

   _____

9. A NOR gate outputs 1 only when both inputs are 0.

   ☐ True ☐ False

10. For X = (A AND B) OR C with A=1, B=0, C=1, what is X?

    ☐ 0

    ☐ 1

    ☐ 2

    ☐ cannot tell

1. **both inputs are 1**

   AND outputs 1 only when every input is 1.

2. **do A AND B, do NOT C, then OR the two results**

   Work out each part – (A AND B) and (NOT C) – then OR them together.

3. **both inputs are 0**

   OR is 1 if at least one input is 1, so it is 0 only when both are 0.

4. **8**

   Each input doubles the combinations: 2^3 = 8 rows (000 to 111).

5. **the two inputs are different**

   XOR (exclusive OR) is 1 when the inputs differ.

6. **draw it exactly as the statement says, without simplifying**

   At IGCSE you draw the circuit as described – simplification is not required.

7. **1**

   NOR = NOT OR. OR of (0,0) is 0, so NOR is 1. NOR is 1 only when both inputs are 0.

8. **16**

   $2^4 = 16$ combinations of inputs.

9. **True**

   OR gives 0 only for 0, 0; NOT then turns it into 1.

10. **1**

    A AND B = 0; 0 OR C(=1) = 1, so X = 1.

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