MODERN SCIENCE ACADEMY

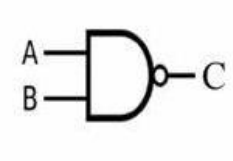
16."BASIC ELECTRONICS"

Choose the correct answers from the following choices.

1) The process by which electrons are emitted by a hot metal surface is known as:
(a) boiling (b) evaporation (c) conduction (d) thermionic emission

2) The particles emitted from a hot cathode surface are:
(a) positive ions (b) negative ions (c) protons (d) electrons

3) The logical operation performed by this gate is:
(a) AND (b) NOR (c) NAND (d) OR



4) AND Gate can be formed by using two:
(a) NOT gates (b) OR gates (c) NOR gates (d) NAND gates

5) The output of a two input NOR gate is 1 when:
(a) A=1 and B=0 (b) A=0 and B=1 (c) both A and B are 0 (d) both A and B are 1

6) If **X=A.B** , the X is 1 when:
(a) A and B are 1 (b) A or B is 0 (c) A=0 and B=1 (d) A=1 and B=0

7) The output of a NAND gate is 0 when:
(a) both of its inputs are zero (c) any of its inputs is 0
(b) both of its inputs are 1 (d) any of its inputs is 1

8) The biggest achievement of electronics is:
(a) calculator (b) transistor (c) computer (d) mobile

9) Typical value of the voltage and current used for thermionic emission from tungsten filament is:
(a) 6V and 0.3A (b) 12V and 0.3A (c) 12V and 3A (d) 6V and 3A

10) The screen of CRO is made up of:
(a) Zinc (b) Iron (c) Phosphor (d) Glass

11) The brightness of spot on CRO fluorescent screen is controlled by:
(a) anode (b) grid (c) plates (d) cathode

12) In CRO, the potential of grid is:
(a) Zero (b) positive (c) negative (d) neutral

13) George Boole invented:
(a) Geometry (b) Calculus (c) Trigonometry (d) Boolean Algebra

14) Boolean expression for AND operation is:
(a) X=A+B (b) X=$\overline{A+B}$ (c) X=A.B (d) X=A.B

15) Which logic gate is similar to two series switches?
(a) AND (b) OR (c) NAND (d) NOR

16) NOT gate is also called:
(a) convertor (b) invertor (c) adder (d) subtractor

17) Number of input terminals in NOT gate is:
(a) 1 (b) 2 (c) 3 (d) 4

18) Which gate is used to make burglar alarm?
(a) OR gate (b) AND gate (c) NAND Gate (d) NOR gate

19) Boolean expression for NOR gate:
(a) X=A+B (b) X=$\overline{A+B}$ (c) X=$\overline{A.B}$ (d) X=A.B

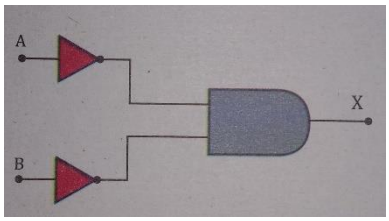
20) If electric field is applied parallel to its direction of electron beam, the electrons will:
(a) speed up (b) slow down (c) deflect (d) none

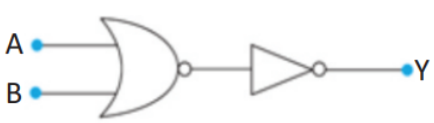
21) If magnetic field is applied parallel to its direction of electron beam, the electrons will:
(a) speed up (b) slow down (c) deflect (d) none

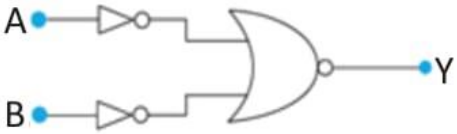
MODERN SCIENCE ACADEMY

Important Short Questions

1) What are free electrons?
2) What is meant by thermionic emission? Name two factors which can enhance thermionic emission?
3) Describe using diagrams, what happens when a narrow beam of electrons passes through a uniform electric field and a uniform magnetic field? What do these results indicate about charge on electron.
4) Give three reasons to support the evidence that cathode rays are negatively charged.
5) Why image is distorted when a magnet is bought close to the old television screens with CRT inside?
6) How can you control brightness of waveform on the screen of CRO?
7) What is the function of an accelerating anode in an electron gun?
8) Considering an oscilloscope explain:-
    i. How the filament is heated?
    ii. Why the filament is heated?
    iii. Why the anode potential is kept positive w.r.t the cathode potential?
    iv. Why the large potential is applied between anode and cathode?
    v. Why the tube is evacuated?
9) Differentiate between analogue and digital **quantities** by examples and graphs.
10) Differentiate between analogue and digital **electronics.** Write names of five analogue and digital devices.
11) Define ADC and DAC.
12) Write down some benefits of using digital electronics over analogue electronics.
13) Define Boolean algebra, truth tables and logic gates.
14) What are three universal logic gates? Give their symbols and truth tables.
15) What is NAND Gate? Draw its symbol and truth table.
16) What is NOR Gate? Draw its symbol and truth table.
17) What is the difference to produce a LOW(0) output for an OR gate and AND gate?
18) What is the difference to produce a HIGH(1) output for an OR gate and NOR gate?
19) Draw a logic circuit for the logic equation $X=A+\overline{B}$.
20) What is the outputs of the following three circuits:







"Important Long Questions"

A. Describe the construction and working of electron gun?
B. What is Cathode Ray Oscilloscope (CRO)? Describe the working of its different parts and its uses.
C. What is the difference between analogue and digital electronics? (At least seven)