

Exercise MCQs

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 is '1' and B is '0' (B) A is '0' and B is '1'
(C) both A and B are '0' (D) both A and B are '1'

6. If $X = A.B$, then X is '1' when:

- (A) A and B are '1' (B) A or B is '0'
(C) A is '0' and B is '1' (D) A is '1' and B is '0'

7. The output of a NAND gate is '0' when:

- (A) both of its inputs are '0' (B) both of its inputs are '1'
(C) any of its inputs is '0' (D) any of its inputs is '1'

Answer Key:

1	(D)	5	(C)
2	(D)	6	(A)
3	(C)	7	(B)
4	(D)		

Short Questions

Q1: Define Electronics?

Ans: Electronics is the branch of physics that deals with the control of motion of electrons using different devices.

Q2: Explain the working of different Parts of Oscilloscope?

Ans: Parts of Oscilloscope are:

- The electron gun with control grid
- The deflecting plates

- A fluorescent screen

Q3: Name Some Uses of Oscilloscope?

Ans: Uses of Oscilloscope:

- It is used in many fields of science; displaying waveforms, measuring voltage, range finding and echo sounding.
- It is used to display heart beats.

Q4: What is cathode ray oscilloscope?

Ans: The cathode ray oscilloscope is an instrument which is used to display the magnitudes of changing electric currents or potentials.

Q5: What is Electron gun? Describe the process of thermionic emission?

Ans: Electron Gun:

“Electron gun is used to investigate the properties of electron beam”. The electrons are produced by thermionic emission from a tungsten filament heated by 6 V supply.

Thermionic emission:

The process of emission of electrons from the hot metal surfaces is called Thermionic emission.

Q6: What do you understand by Analogue Quantities and Digital Quantities?

Ans: The difference between Analogue Quantities and Digital Quantities is:

Analogue Quantities	Digital Quantities
<ul style="list-style-type: none"> ➤ The quantities whose values vary continuously are known as Analogue Quantities. ➤ Time, Pressure, Distance etc. 	<ul style="list-style-type: none"> ➤ The quantities whose values vary in non-continuous manner are called Digital Quantities. ➤ 0 and 1 Numbers.

Q7: Differentiate between Analogue and Digital Electronics. Write down name of five Analogue and five Digital device that are commonly used in everyday life?

Ans: The difference between Analogue and Digital Electronics is:

Analogue Electronics	Digital Electronics
<p>The branch of electronics consisting of circuits which process analogue quantities is called Analogue electronics.</p> <p>Analogue Devices:</p> <ul style="list-style-type: none"> Loud speaker Radio Temperature sensor 	<p>The branch of electronics which deals with digital quantities is called Digital electronics.</p> <p>Digital Devices:</p> <ul style="list-style-type: none"> Modern telephone system Naval and other systems of military importance Computer

Q8: Define Boolean Algebra.

Ans: The algebra used to describe logic operations by symbols is called Boolean algebra.

Q9: Write down some benefits of using Digital electronics over Analogue electronics?

Ans: The benefits of using Digital electronics over Analogue electronics are:

- Digital electronics require Boolean algebra which is very simple.
- In digital electronics only 1 and 0 are used so data error is reduced.
- Circuit of digital electronics is small.

Q10: What are the Three Universal Logic Gates? Give their Symbols and Truth

tables.

Ans: Universal Logic Gates:

A universal logic gate is one that can be put together in different configurations to perform all the Boolean operations.

(1) AND Gate.

(2) OR Gate.

(3) NOT Gate.

(1) **AND Gate:**

The circuit which implements the AND operation is known as AND Gate.

Truth Table:

A	B	$X = A \cdot B$
0	0	0
0	1	0
1	0	0
1	1	1

(2) **OR Gate:**

The electronic circuit which implements the OR operation is known as OR Gate.

Truth Table:

A	B	$X = A + B$
0	0	0
0	1	1
1	0	1
1	1	1



(3) **NOT Gate:**

The electronic circuit which implements NOT operation is known as NOT Gate.

Truth Table:

A	A
0	1
1	0

Q11: Name two factors which can enhance thermionic emission?

Ans: The names of two factors which can enhance thermionic emission are:

- Magnitude of the charge flow increases dramatically with increasing temperature.
- The substance used as a filament because different materials have different number of free available electrons.

Q12: Give three reasons to support the evidence that cathode rays are negatively charged electrons?

Ans: The three reasons in which support the evidence that cathode rays are negatively charged electrons are:

- Negatively charged particles are primarily that they are deflected by a magnet in just the same way as moving negatively electrified particles.
- The cathode rays are deflected and accelerated towards positively charged plate.
- They are negative in nature.

Q13: Write the use of logic gates?

Ans: Logic gates are used in safety alarm and alarm gate.

Q14: When a moving electron enters the magnetic field, it is deflected from its straight path. Name two factors which can enhance electron deflection?

Ans: Following are the two factors which can enhance electron deflection:

- Angle between magnetic lines and the moving electron is matter.
- The intensity of magnetic field, more the intensity of magnetic field more will be the deflection force.

Q15: How can you compare the logic operation $X = A.B$ with usual operation of multiplication?

Ans: It is called AND gate. The truth table of this gate is given below:

A	B	X
0	0	0
1	0	0
0	1	0
1	1	1

Q16: NAND gate is the reciprocal of AND gate. Discuss

Ans: In Truth Table of NAND gate, it is clear that it is the reciprocal of AND gate.

A	B	$X = A . B$
0	0	1
0	1	1
1	0	1
1	1	0

A	B	$X = A . B$
0	0	0
0	1	0
1	0	0
1	1	1

Additional Short Questions

Q17: What is meant by ADC and DAC?

Ans: The circuit which converts the analogue signals to digital signals. The circuit which converts the digital signals to analogue signals.

Q18: Define bit and byte?

Ans: "A bit represents data using 1's and 0's" While "Eight bit is a byte"

Q19: Name two factors which enhance thermionic emission?

Ans: Thermionic emission depends upon the temperature, voltage and nature of material.

Q20: What do you mean by fluorescent screen?

Ans: The screen of a cathode-ray tube consists of a thin layer of phosphor.

Q21: Define Logic function OR Logical Operations?

Ans: The binary arithmetic operations with binary digits "1" and "0".

Q22: Write the components of CRO?

Ans: The components of CRO are:

- The electron gun
- The deflecting plates
- A fluorescent screen

Q23: Define truth table?

Ans: Set of inputs and outputs in binary form is called truth table.

