

**HSETIRK014**

**1701 - X**

**PHYSICS**

(Long Answer Type Questions)

1. Explain the principle of a Capacitor. Deduce an expression for the energy stored in a parallel plate capacitor.

Or

State Gauss's Theorem. Use it to derive an expression for electric field at a point near an infinitely long straight charged wire.

2. Describe the principle and construction of a moving coil galvanometer. Prove that current flowing in the coil is directly proportional to its deflection.

Or

Using Biot-Savart law, obtain an expression for the magnetic field at a point on the axis of circular current loop.

3. State and explain the phenomena of Self-induction. Hence define the Coeff. of Self induction

4. Define Impedance. Derive an expression for it in LCR circuit connected to a e. supply

5. State Huygen's principle. Deduce the laws of reflection on the basis of Huygen's principle.

Or

Derive an expression for the fringe width in Young's double slit experiment,

(Short Answer Type Questions)

6. Calculate the resistivity of the material of a wire of length 1.0 m, diameter 0.4 m and having a resistance of 2.0 in ohm.

7. Explain how resistance of a conductor varies with temperature. <https://www.jkboseonline.com>

8. What is Polarisation? With the help of a diagram explain plane of polarisation and plane of vibration.

9. For a given source of light, the angle of minimum deviation of a  $60^\circ$  prism is  $40^\circ$  What is its refractive index?

10. Derive the expression for the radius of the ground states orbit of hydrogen using Bohr's postulates.

10. Describe NOR gates.

11. Explain the formation of energy bands in solids.

12. Discuss Sky and Space wave propagation.

(Very Short Answer Type Questions)

13. The following very short answer type questions of two marks, each may be answered in a few words or few sentences or as may be required,

(a) Give the properties of electric line of forces.

(b) Define the term declination, dip and horizontal component

(c) Calculate the inductive reactance of a 1mH coil for a frequency of 50 Hz.

(d) Give the wavelength and frequency of

(i) Radio waves.

(ii) Infrared waves.

(e) Give the characteristics of Binding energy curve.

(f) State the laws of Photoelectric effect.

(g) Derive an expression for the De-Broglie wavelength.

(h) Define Magnifying power and resolving power of a telescope.

(Objective Type Questions)

14. Choose the correct/most appropriate answer and write it in your Answer-book

(1) A charge of 5C is moved along on equipotential surface having a pot of 10 volts. The work done is

A. 50 J

B. 2J

C. 0.5 J

D. Zero

(ii) Which of the following is a non-ohmic element?

A. Diode

B. Carbonresistance

C. Tungsten wire

D. Copper wire

(iii) Define Tesla

(iv) On what principle is transformer based

(v) If power of a lens is 5 diopetre, its focal length will be.....

(vi) The density of the nucleus is of the order of .....

(vii) A P-type semiconductor is positively charged (True/False)

(viii) Dimension of  $\frac{1}{\sqrt{\mu_0 \epsilon_0}}$  is

A.  $LT^{-1}$

B.  $LT^{-2}$

C.  $L^{-1}T^{-2}$

D.  $L^2T^{-1}$

(ix) Modem is a device which performs

A. Modulation

B. Rectification

C. Dc-modulation

D. Modulation and demodulation.

(x) Bulk of power in an AM wave is carried by.....