B–1–Y

Roll No.....

Total No. of Questions : 21] [Total No. of Printed Pages : 4

XIIKDRO/N19
24801-Y
PHYSICS

Time : 3 Hours] **[Maximum Marks : 70**

(Long Answer Type Questions) 5 each

1. Derive an expression for the torque experienced by an electric dipole placed in a uniform electric field. What is the net force acting an this electric dipole ?

Or

Describe briefly the principle, construction and working of Van-de-Graaff electrostatic generator.

2. What are dia, para and ferromagnetic substances ? Discuss their important properties.

Or

Derive an expression for the force acting an a current carrying conductor placed in a uniform magnetic field. When the force is :

(i) Maximum

(ii) Minimum

3. Derive an expression for the average power in LCR series circuit connected to A.C. supply. Hence define power factor.

Or

Describe the principle, construction and working of a transformer.

4. State Huygen's principle and prove the laws of reflection on its basis.

Or

What is diffraction of light ? Describe diffraction of light at a single slit.

(Short Answer Type Questions) 3 each

5. A capacitor of capacitance 20 μF is charged to a potential of 500 V. Calculate the charge and energy stored in a capacitor.
6. Establish the relation between drift velocity of electrons and electric current.
7. What are magnetic lines of force ? Why two such lines do not cross each other ?
8. Distinguish between self-inductance and mutual inductance.
9. Calculate the speed of light in a medium whose critical angle is 45°.
10. What are Polaroids ? Write *four* uses of polaroids.
11. Explain with the help of a circuit diagram how a zener diode can be used as voltage regulator ?
12. Explain briefly why modulation is needed at all.

(Very Short Answer Type Questions) 2 each

13. How many electrons pass through a wire in 2 minutes if current passing through the wire is 300 mA ?
14. Write *four* characteristics of electromagnetic waves.
15. What is total internal reflection ? What are its essential conditions ?
16. Define work function and give its units.
17. What are the limitations of Bohr's atomic model ?
18. What are isotones ? Give one example.
19. Give the logic symbol and truth table for NOT gate.
20. Describe sky wave propagation.

(Objective Type Questions) 1 each

21. (i) What do electromagnetic waves consist of ?

(ii) Define sensitivity of a material.

(iii) Kirchhoff's first law is based on ..... .

(iv) A wave front is propagated ..... .

(v) What is meant by doping ?

Choose the correct/most appropriate answer :

(vi) If electron and proton are possessing same amount of kinetic energies. The de-Broglie wavelength is greater for :

(A) Electron (B) Proton

(C) Both (A) and (B) (D) None of these

Turn Over

(vii) The magnitude of saturated photoelectric current depends upon :

(A) Frequency (B) Intensity

(C) Work function (D) Stopping potential

(viii) The size of atom is of the order of :

(A) 10^{-14} m (B) 10^{-12} m

(C) 10^{-10} m (D) 10^{10} m

(ix) In which region of electromagnetic spectrum does the Lyman series of hydrogen atom lie ?

(A) Ultra violet (B) X-rays

(C) Infrared (D) Visible

(x) In NPN transistor, the maximum current passes through :

(A) Collector (B) Emitter

(C) Base (D) Same in all