G–1

XIIARPLKGN20

2401

PHYSICS

(New/Old Course)

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

(Old Course)

(Long Answer Type Questions) 5 each

1. **State and explain the principle of superposition in electrostatics.**

Or

Define Capacity. Derive an expression for the capacity of parallel plate capacitors.

2 Using Biot Savart law derive an expression for magnetic field on the axis of circular coil

Or

Draw an expression for the force on a current carrying conductor in a inform magnetic field

3. Varify the laws of reflection using Huygens wave theory

Or

Describe an astronomical telescope and derive an expression for its magnifying power in normal adjustment.

4. Discuss resonance in LCR series a.c. circuit. Explain sharpness of resonance.

Or

Draw the labelled diagram of A.C. generator. State its principle and its working.

(Short Answer Type Questions)

5. Calculate the electric potential of the surface of gold nucleus Given radius of nucleus 6.6×10^{-15} m and atomic number of gold is 79

6. What is poliontal gradiant ? How is it measured ? Explain

7. A 220 volt-100 W bulb is introduced to 110 V source Calculate the power consumed by the bulb.

8. Name *three* methods to produce induced emf in a coil. Explain one of them.

9. Derive the relation between refractive index of a medium and its critical angle.

10. Write down Einstein's photoelectric equation. What is threshold frequency ?

11. State postualtes of Bohr's theory of hydrogen atom.

12. How a *p-n* Junction diode is used as half wave rectifier ? Draw the circuit diagram.

(Very Short Answer Type Questions) 2 each

13. Define angle of dip at a given place.

14. What is the origin of displacement current ?

15. A ray of light suffers minimum deviation while passing through prism of refractive index 1.5 and refracting angle 60°. Calculate the angle of incidence.

16. Write down the properties of α-rays.

17. Give the truth table and logic symbols of NOR gate.

18. What is Audio bandwidth ?

19. What is sky wave, where it is used ?

20. State Brewster's law. Write the relation between polarizing angle and refractive index.

(Objective Type Questions)

21. (i) Define Fermi Energy.

(ii) Field inside the solenoid is :

(A) Directly proportional to length

(B) Directly proportional to current

(C) Inversely proportional to number of turns

(D) Inversely proportional to current

(iii) The momentum of a photon is p The wavelength λ is

(A) h/p (B) hp

(C) p/h (D) $h/\sqrt{p}$

(iv) What is dispersive power of a material ?

(v) Define the term communication.

(vi) Is the light from the bulb an electromagnetic wave ?

(vii) Which of the following has a largest work function ?

(A) Sodium **(B) Barium**

(C) Calcium **(D) Lithium**

(viii) The energy gap of silicon is ..... .

(ix) If θ is the polarizing angle then the refractive index of the material is :

(A) $\sin \theta$

(B) $\cos \theta$

(C) $\tan \theta$

(D) $\cot \theta$

(x) The resistivity of a metal is ρ and that of an alloy is ρ' then

(A) $\rho' > \rho$

(B) $\rho' < \rho$

(C) $\rho' = \rho$

(D) No simple relation between ρ and ρ'.