PR X (A-I-B4) 25

PHYSICS (New Course)

10th (Fresh/Reappear)

Note: Time allowed for Section – B and Section – C is 2 Hours and 45 minutes.

Section – B

Marks: 32

Answer any EIGHT parts. Each part carries FOUR marks.

Q.1 What is the difference between echo and reverberation?

Q.2 Find the speed of sound in air at 15°C.

Q.3 What are the symptoms and causes of long-sightedness and how can it be corrected by using lenses?

Q.4 Explain the law proposed by Coulomb about electric force between stationary point charges.

Q.5 Explain electrical power and derive three equations for it using Ohm's law.

Q.6 A current of 6 A is used to boil a kettle in 15 minutes using 4.32×10^5J of energy. Find the potential difference across the kettle.

Q.7 What is induced EMF and identify three factors that influence its magnitude?

Q.8 Define logic gates and describe the operation of NOR gate by drawing its symbol and truth table.

Q.9 Define information storage devices and describe the use of CD and DVD.

Q.10 Write the nuclear reaction for the alpha decay of $^{263}_{106}X$ and $^{218}_{84}X$. (X represents parent and Y represents daughter nuclei).

Q.11 What are radioisotopes? Describe any two medical uses of radioisotopes.

Section – C

Marks: 21

Note: Attempt any THREE questions. All questions carry equal marks.

Q-12 (a) What is Simple Pendulum? Show that time period of Simple Pendulum is independent of its mass and amplitude.

(b) Find the time period of a pendulum with a length of 0.6 m, that swings on Mercury where gravitational field strength is 3.73 m/s^2.

Q-13 (a) How does total internal reflection occur, what is the method to calculate the critical angle, and what conditions are necessary for it to occur?

(b) An optical fiber made of flint glass (refractive index 1.66) is surrounded by crown glass (refractive index 1.52), find the critical angle.

Q-14 (a) What is meant by capacitance? Derive the formula for the effective capacitance when capacitors are connected in parallel.

(b) Two capacitors of 6 μF and 8 μF are connected in parallel through a voltage source of 100 V. Calculate the total capacitance and charge on each capacitor.

Q-15 (a) How does AC generator work? Explain its construction and working principle.

(b) If the current through the primary coil changes from –63 A to +7 A in 0.02 s, such that the induced emf is 1.4 V. Find the mutual inductance.