

# Physics Sample Paper for Class XI

## Bihar Board

Time Duration : 2 hours

Marks : 70

### General Instructions:

This paper consists of three sections

Section-A has 1-10 question carrying 2 marks each.

Section -B has 11-20 question carrying 3 marks each.

Section-C has 21-24 question carrying 5 marks each.

Marks are allotted to each section.

### SECTION – A (VERY SHORT ANSWER QUESTIONS)

Note: Answer all the questions.  $10 \times 2 = 20$  Marks

1. An electron is accelerated through a P.D. of 182 volt. Calculate its associative wave length.

2. State Lenz's law.

Modern air crafts fly at heights upwards of 10 km. Calculate the value of 'g' at that altitude. Given the radius of the earth is 6400 km and the value of 'g' on the surface of the earth is  $9.8 \text{ ms}^{-2}$ .

3. How does kerosene oil raise in the wick of a lantern ?

4. . Define total internal reflection and write the relation between critical angle and refractive index of the media ?

5. Distinguish between transverse and longitudinal waves.

6. Modern air crafts fly at heights upwards of 10 km. Calculate the value of 'g' at that altitude. Given the radius of the earth is 6400 km and the value of 'g' on the surface of the earth is  $9.8 \text{ ms}^{-2}$ .

7. When current drawn from a cell increases, the potential difference between the cell electrodes decreases, Why ?

8. Why do two layers of cloth of equal thickness provide warmer covering than a single layer of cloth of double the thickness ?

9. Calculate the focal length of a lens if the radii of curvature of its two surfaces are +20 cm and -25 cm. ( $u = 1.5$ ) ?

10. Why does the car with a flattered tyre stops sooner than the one inflated tyres ?

### SECTION – B (SHORT ANSWER QUESTIONS)

Note : Answer any Six Questions  $10 \times 3 = 30$  Marks

11. Differentiate between junction diode and zenor diode ?

12. Distinguish UPS from Invertor ?

13. What do you understand by terms film size and speed ?

14. State and prove work – energy theorem ? What happens to kinetic energy of a particle if the speed of the particle is doubled ?

15. State Bernoulli's theorem and write down the equation. Under what conditions Bernoulli's theorem is applicable to a fluid ?

16. Show that the motion of simple pendulum is simple harmonic and derive expression for its time period ?

17. For the circuit shown here, calculate the current flowing in  $6\ \Omega$  resistor ?

- $6\ \Omega$   $12\ \Omega$
- $4\ \Omega$
- $6\ \text{V}$

18. Explain the defects in image formation of optical instruments ?

19. How does a p.n junction diode works as a half wave rectifier ?

20. What is an inverter ? Write how it works ?

### SECTION – C (LONG ANSWER QUESTIONS)

Note: Answer any Three Questions  $5 \times 4 = 20$  Marks

21. Explain the various steps involved in audio recording and reproduction?

22. State Newton's second law of motion. Hence derive the equation of motion  $F = ma$  from it. A Constant force of magnitude  $50\text{N}$  is applied to a body of mass  $10\text{ kg}$  moving initially with a speed of  $10\text{ ms}^{-1}$ . How long will it take the body to stop if the force acts in a direction opposite to its motion.

23.

a. Define specific heats of gas

- b. Calculate  $C_p$  and  $C_v$  for argon. Given  $R = 8.3 \text{ J mol}^{-1} \text{ K}^{-1}$ .
- c. Derive the relationship between  $C_p$  and  $C_v$ .

24. Derive condition of balancing wheat stone bridge using Kirchhoff's Law.

