Class XII Physics — Practice Paper 1

Practice paper in the CBSE section pattern · Time: 1 hour · Maximum marks: 30

General instructions

1. This is an original practice paper, shorter than a board paper. It is not an official CBSE sample paper; official sample papers are published at cbseacademic.nic.in.
2. All questions are compulsory. Marks are shown in brackets.
3. Section A has 1-mark questions, Section B 2-mark, Section C 3-mark, Section D a 5-mark question and Section E a case-based question.
4. Write neatly, show your working and check your answers in the last five minutes.

Section A (6 marks)

Multiple choice and assertion–reason. 1 mark each.

1. The SI unit of electric flux is: [1]
   (a) N C^{-1}
   (b) N m^2 C^{-1}
   (c) C m^{-2}
   (d) V m^{-1}

2. Lenz's law follows from the conservation of: [1]
   (a) charge
   (b) momentum
   (c) energy
   (d) mass

3. The stopping potential in the photoelectric effect depends on the light's: [1]
   (a) intensity
   (b) frequency
   (c) speed
   (d) exposure time

4. The power of a convex lens of focal length 50 cm is: [1]
   (a) +0.5 D
   (b) +2 D
   (c) −2 D
   (d) +50 D

5. Which of these has the highest frequency? [1]
   (a) radio waves
   (b) microwaves
   (c) visible light
   (d) X-rays

6. Assertion (A): A p–n junction diode conducts in forward bias. [1]
   Reason (R): In forward bias the depletion layer becomes narrower.
   (a) Both true, R explains A
   (b) Both true, R does not explain A
   (c) A true, R false
   (d) A false, R true

Section B (6 marks)

Very short answers. 2 marks each.

7. Two point charges of +2 μC and +8 μC are 30 cm apart in vacuum. Find the force between them. [2]

8. Find the de Broglie wavelength of an electron accelerated through 100 V. [2]

9. Why is the core of a transformer laminated? [2]

Section C (9 marks)

Short answers. 3 marks each.

10. A cell of emf 12 V and internal resistance 1 Ω is connected to a 5 Ω resistor. Find the current, the terminal voltage and the power in the resistor. [3]

11. In Young's double-slit experiment, slit separation is 0.5 mm, screen distance 1 m and wavelength 600 nm. Find the fringe width and the distance of the third bright fringe from the centre. [3]

12. Using Bohr's model, find the energy of the photon emitted when a hydrogen electron falls from n = 3 to n = 2, and its wavelength. [3]

Section D (5 marks)

Long answer. 5 marks.

13. A series LCR circuit has R = 30 Ω, X_L = 80 Ω and X_C = 40 Ω on a 200 V (rms) supply. Find the impedance, current, phase angle, power factor and average power. [5]

Section E (4 marks)

Case-based question. 4 marks.

14. Optical fibres carry light over long distances by total internal reflection. [4]
(i) State the two conditions for total internal reflection. (2)
(ii) Find the critical angle for glass of refractive index 1.5 in air. (1)
(iii) Give one use of optical fibres. (1)

Answer key and marking guide

Award marks for each correct step shown in brackets. Accept any correct method or equivalent wording; value points are a guide, not a script.

Section A

Q	Answer	Marking
1	(b) N m² C⁻¹	1 mark for the correct answer.
2	(c) energy	1 mark for the correct answer.
3	(b) frequency	1 mark for the correct answer.
4	(b) +2 D	P = 1/f in metres.
5	(d) X-rays	1 mark for the correct answer.
6	(a)	1 mark for the correct answer.

Section B

Q	Answer	Marking
7	1.6 N (repulsive)	Coulomb's law with values (1); 1.6 N, repulsive (1).
8	≈ 0.123 nm	λ = 1.227/√V nm (1); 0.1227 nm (1).
9	To reduce eddy currents and the heat they waste	Eddy currents (1); energy loss reduced (1).

Section C

Q	Answer	Marking
10	2 A; 10 V; 20 W	1 mark each.
11	1.2 mm; 3.6 mm	β = λD/d (1); 1.2 mm (1); 3β = 3.6 mm (1).
12	≈ 1.89 eV; ≈ 656 nm	E = 13.6(1/4 − 1/9) eV (1); 1.89 eV (1); λ = hc/E ≈ 656 nm (1).

Section D

Q	Answer	Marking
13	Z = 50 Ω; I = 4 A; φ ≈ 53°, current lags; power factor 0.6; P = 480 W	1 mark each.

Section E

Q	Answer	Marking
14	(i) Light goes from denser to rarer medium; angle of incidence exceeds the critical angle (ii) ≈ 41.8° (iii) e.g. internet cables, endoscopy	(i) 1 each. (ii) sin c = 1/1.5 (1). (iii) 1.

Marking guide in brief

- Step marks: a correct method with a slip in arithmetic keeps most of the marks.
- Units, labels and a final statement are part of the answer.
- In long answers, marks go to the points made, not the length.
- Time check: about 1 minute per mark leaves time to revise.