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CLASS 12

Physics

Chapterwise PYQs

14 sections | 42 questions | 2022, 2023, 2024, 2025, 2026

CBSE board examination questions

Selected and rewritten questions are grouped under the current chapters or course topics. Each question shows its examination year. A chapter appears only when a verified question is available.

Choose a chapter or topic

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CHAPTER 1

Electric Charges and Fields

Physics

1. 2023

   Explain electric flux and state its SI unit.

CHAPTER 2

Electrostatic Potential and Capacitance

Physics

2. 2024

   Derive a dipole's potential energy in a uniform electric field and identify its maximum and minimum orientations.

CHAPTER 3

Current Electricity

Physics

3. 2026

   A 21 V cell with internal resistance 3 Ω supplies 3 A. Find the external resistance and terminal voltage.

4. 2026

   Derive the current–drift-velocity relation. At fixed voltage, what happens to drift velocity when conductor length doubles?

5. 2025

   For two cells connected in parallel, derive the equivalent emf and internal resistance in terms of their individual values.

6. 2024

   A uniform wire is stretched to 1.25 times its original length without changing volume. Find the percentage resistance increase.

7. 2024

   Explain a Wheatstone bridge and derive its balance condition.

CHAPTER 4

Moving Charges and Magnetism

Physics

8. 2023

Bend equal-length wires into a square and an equilateral triangle, each carrying current I. Compare their magnetic moments.

CHAPTER 5

Magnetism and Matter

Physics

9. 2023

Give two differences between diamagnetic and paramagnetic materials.

CHAPTER 6

Electromagnetic Induction

Physics

10. 2025

Derive the self-inductance of a long solenoid of area A, length l and n turns per unit length.

11. 2025

Explain an AC generator's operating principle and construction with a labelled diagram.

CHAPTER 7

Alternating Current

Physics

12. 2026

Compare an inductor's response to DC and high-frequency AC. Represent its voltage–current phase relation with a phasor diagram.

13. 2024

Sketch resistance, capacitive reactance and inductive reactance as functions of AC frequency.

14. 2023

For v = Vm sinωt across an ideal capacitor, derive current and capacitive reactance; sketch current against time.

CHAPTER 8

Electromagnetic Waves

Physics

15. 2025

Identify electromagnetic waves used in radar, eye surgery and medical diagnosis, including their wavelength ranges.

16. 2024

Explain why X-ray astronomy requires space-based observatories while optical and radio observations can be ground-based.

17. 2022

Represent an electromagnetic wave travelling along x, write its field expressions and give three properties.

CHAPTER 9

Ray Optics and Optical Instruments

Physics

18. 2026

A convex lens has focal length 20 cm and an object 30 cm away. Calculate image position and state its nature.

19. 2025

Draw a concave mirror producing a real enlarged image and derive the mirror formula.

20. 2025

Derive magnification of a compound microscope adjusted for a final image at infinity, using a ray diagram.

21. 2024

An object is 30 cm before a concave mirror of radius 40 cm. Calculate image position and magnification.

22. 2024

A plano-convex lens has focal length 16 cm and refractive index 1.4. Find its curved-surface radius.

23. 2022

Draw a normally adjusted astronomical telescope and derive its angular magnification.

24. 2022

Does light travel through glass at the same speed for every colour? Explain.

CHAPTER 10

Wave Optics

Physics

25. 2026

Explain why everyday diffraction is more apparent for sound than for visible light.

26. 2023

In single-slit diffraction, explain how wavelength affects central-maximum width and state the first-minimum condition.

CHAPTER 11

Dual Nature of Radiation and Matter

Physics

27. 2026

A stationary particle breaks into two moving fragments. Determine their de Broglie wavelength ratio using momentum conservation.

28. 2024

A neutron of mass m and a photon each have energy E. Derive the ratio of their wavelengths.

29. 2022

Illumination at frequencies v1 and v2 produces maximum photoelectron energies K and 2K. Derive the threshold frequency in terms of v1 and v2.

30. 2022

Compare alpha-particle and proton de Broglie wavelengths for equal speeds, equal kinetic energies and equal accelerating voltages.

CHAPTER 12

Atoms

Physics

31. 2025

Identify the centripetal force in Bohr's hydrogen model; derive orbital energy and interpret its negative sign.

CHAPTER 13

Nuclei

Physics

32. 2026

Explain mass defect and binding energy and give their mathematical relationship.

33. 2026

Contrast nuclear fission and fusion, illustrating each with a reaction.

34. 2023

Sketch binding energy per nucleon against mass number and explain the decline for very heavy nuclei.

35. 2023

Use the nuclear-radius relation to show that nuclear density is approximately constant.

36. 2022

Sketch nucleon potential energy against separation and identify its important features.

CHAPTER 14

Semiconductor Electronics: Materials, Devices and Simple Circuits

Physics

37. 2026

Explain the creation of electrons and holes in a pure semiconductor.

38. 2025

Why do electrons remain the majority carriers in an n-type semiconductor despite continuous recombination?

39. 2023

Explain the diode property underlying rectification, then compare half-wave and full-wave rectifiers.

40. 2023

Draw forward- and reverse-biased diode circuits and their current–voltage characteristics.

41. 2022

Explain how the depletion layer develops at a p–n junction.

42. 2022

Explain full-wave diode rectification using a circuit and input/output waveforms.

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