BOARD-PATTERN PRACTICE PAPER · CBSE CLASS 12

Electrostatic Potential and Capacitance

Physics · Chapter 2 · Matches current CBSE blueprint · Each question PYQ-sourced where indicated

DATE	TOTAL MARKS	DURATION	MARKING	TARGET
_____	30	60 min	As per board	≥ 24/30

GENERAL INSTRUCTIONS

1. All questions are compulsory.
2. Marks shown in brackets.
3. Show full working for numerical questions.
4. Use $k = 9\times10^{9}$ Nm²/C², $\varepsilon_0 = 8.85\times10^{-12}$ C²/Nm².
5. Use of calculator NOT permitted.

Section A — MCQ (1 mark each, 6 Qs) — 6 MARKS · 10 MIN

Q1. SI unit of electric potential is ____ . *[PYQ 2018 Delhi]* **[1 mark]**

Q2. Relationship between E and V: E = ____ . *[PYQ 2019 All India]* **[1 mark]**

Q3. Equipotential surfaces are always ___ to electric field lines. *[PYQ 2020 Delhi]* **[1 mark]**

Q4. Capacitance of parallel-plate capacitor with dielectric K is: C = ____ . *[PYQ 2021 Standard]* **[1 mark]**

Q5. Energy stored in capacitor: U = ____ (in terms of Q and C). *[PYQ 2020 Outside Delhi]* **[1 mark]**

Q6. Series of two equal capacitors C gives C_eq = ____ . *[PYQ 2018 All India]* **[1 mark]**

Section B — Very Short Answer (2 marks each, 4 Qs) — 8 MARKS · 15 MIN

Q7. State any two properties of equipotential surfaces. *[PYQ 2018 All India]* **[2 marks]**

Q8. Find V at the centre of a square of side 2a, with charges +q, +q, −q, −q at the four corners (alternating). *[PYQ 2019 Delhi]* **[2 marks]**

Q9. Two capacitors C_1 = 6μF and C_2 = 12μF are connected in series. Find C_eq. *[PYQ 2020 Delhi]* **[2 marks]**

Q10. What is the effect on capacitance and stored energy if a dielectric of constant K is inserted in an ISOLATED charged capacitor? *[PYQ 2022 Delhi]* **[2 marks]**

Section C — Short Answer (3 marks each, 3 Qs) — 9 MARKS · 20 MIN

Q11. Derive an expression for the energy stored in a charged capacitor. *[PYQ 2019 Delhi]* **[3 marks]**

Q12. What is meant by an equipotential surface? Show that the work done in moving a charge on such a surface is zero. *[PYQ 2020 Delhi]* **[3 marks]**

Q13. Two parallel-plate capacitors A (C = 3μF) and B (C = 6μF) are connected in parallel across a 12V battery. Find (i) charge on each, (ii) total energy stored. *[PYQ 2023 Standard]* **[3 marks]**

Section D — Long Answer (4 marks each, 2 Qs) — 7 MARKS · 15 MIN

Q14. Derive an expression for the capacitance of a parallel-plate capacitor with a dielectric medium of dielectric constant K filling the space between the plates. *[PYQ 2024 Standard]* **[4 marks]**

Q15. Case study: A 4μF capacitor is charged to 100V and then connected in parallel with an UNCHARGED 6μF capacitor. Find (i) the common voltage after connection, (ii) total charge before and after, (iii) energy lost in the process. *[PYQ 2024 Standard Set 2]* **[3 marks]**

Marking scheme & model answers — see companion *Answer Key* PDF · all PYQs traceable to actual CBSE papers · readyforboards.com · +91 70330 05444