CBSE Board
Class XII Physics – Set 1
Board Paper - 2013

Time: 3 hours **Total Marks: 70**

General Instructions:

1. All questions are compulsory.
2. There are 29 questions in total. Question Nos. 1 to 8 are very short answer type questions and carry one mark each.
3. Question Nos. 9 to 16 carry two marks each, Question Nos. 17 to 25 carry three marks each and Question Nos. 27 to 29 carry five marks each.
4. There is no overall choice. However, an internal choice has been provided in one question of two marks, one question of three marks and all three questions of five marks each. You have to attempt only one of the choices in such questions.
5. Question No. 26 is value based questions carry four marks.
6. Use of calculators is not permitted. However, you may use log tables if necessary.
7. You may use the following values of physical constants wherever necessary:
   $c = 3 \times 10^8$ m/s
   $h = 6.63 \times 10^{-34}$ Js
   $e = 1.6 \times 10^{-19}$C
   $\mu_o = 4\pi \times 10^{-7}$ TmA^{-1}
   $\frac{1}{4\pi\varepsilon_o} = 9 \times 10^9$ Nm^{2}C^{-2}
   $m_e = 9.1 \times 10^{-31}$ kg
   Mass of the Neutron = 1.675×10^{-27} kg
   Mass of the Proton = 1.673×10^{-27} kg

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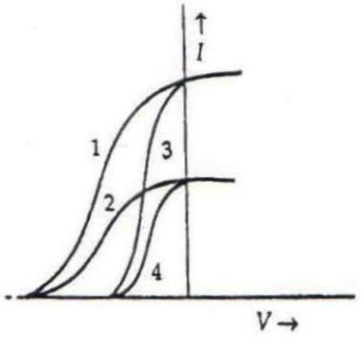
1. What is the geometrical shape of equipotential surfaces due to a single isolated charge?

2. Write the relationship between angle of incidence 'i', angle of prism 'A' and angle of minimum deviation for a triangular prism.

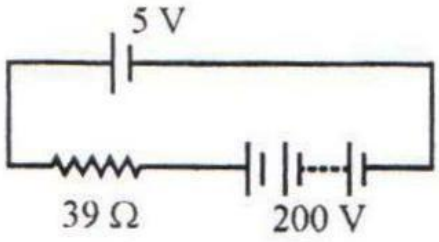
3. A capacitor has been charged by a dc source. What are the magnitudes of conduction and displacement currents, when it is fully charged?

4. The given graph shows the variation of photo-electric current (I) versus applied voltage (V) for two different photosensitive materials and for two different intensities of the incident radiation. Identify the pairs of curves that correspond to different materials but same intensity of incident radiation.



5. Which of the following waves can be polarized (i) Heat waves (ii) Sound waves? Give reason to support your answer.

6. A 5 V battery of negligible internal resistance is connected across a 200 V battery and a resistance of 39 Ω as shown in the figure. Find the value of the current.



7. Which of the following substances are para-magnetic?
Bi, Al, Cu, Ca, Pb, Ni

8. A heating element is marked 210 V, 630 W. Find the resistance of the element when connected to a 210 V dc source.

9. An ammeter of resistance 0.6 Ω can measure current up to 1.0 A. Calculate (i) The shunt resistance required to enable the ammeter to measure current up to 5.0 A (ii) The combined resistance of the ammeter and the shunt.

10. (a) Write the necessary conditions for the phenomenon of total internal reflection to occur.
(b) Write the relation between the refractive index and critical angle for a given pair of optical media.