Holiday Homework(2025-2026)

Name: _____

Date: _____/ _05____/ _2025 **Class: XII-A1,A2**

Subject: Physics

Class-XII(Physics)

Instruction-

1.Learn chapter 1,2 and 3 for unit test -1

Answer all the questions based on chapter 1,2 and 3 from the last years CBSE question papers (2020, 2021 , 2022 and 2023,2024and 2025)

2.Make a flow chart of all the formula from the chapter Electrostatics and current electricity on a separate A4 size sheet for each chapter and then paste sheets in your notebook by using creativity.

3) Prepare a innovative physics project in the grouping of two students as per discussion and allotation in the class.

Investigatory Projects- Physics (2025-26)

As per C.B.S.E. guidelines, all students have to prepare one Investigatory Project carrying 3 marks. All students are therefore, advised to prepare one Investigatory Project on any one of the following topics or any other topic of their choice based on concept of physics after consulting the teacher during the summer vacation.

4)complete the assignment and M.C.Q. in the assignment notebook.

POINTERS FOR MAKING PROJECT REPORT

The material should be placed and bound in the following order:

1. Top Sheet of transparent plastic –The top page of your report should carry the following information in printed form or handwritten in neat block letters:

Name of project
Name of student
Roll no
Date of submission:

2. Aim of Project
3. Apparatus required
4. Principle/theory
5. construction with labeled diagram,
6. Working
7. Observations (to be filled later in lab)
8. Calculations,
9. Result/ Conclusions
10. Applications,
11. Graphs if any,
12. References/bibliography
13. Back cover of plastic: may be opaque or transparent

Note: Complete the practical file and the investigatory project

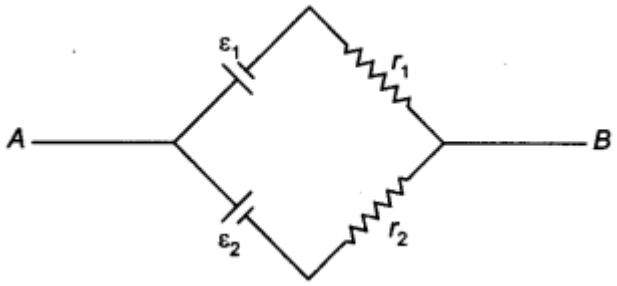
Assignment : Unit 2

GENERAL INSTRUCTIONS:

A: The numerical are based on application of theory content. Attempt them in your physics notebook as practice assignment.
B: Do all questions in sequence.

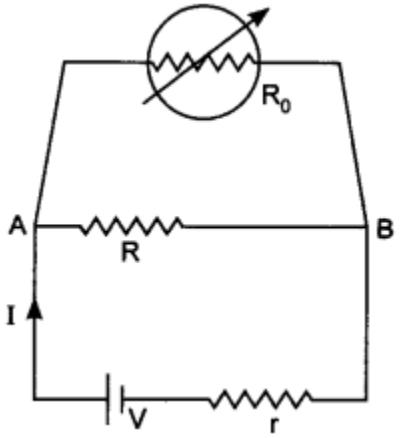
COMPETENCY BASED QUESTIONS

1. Consider a current carrying wire current I in the shape of a circle. Note that as the current progresses along the wire, the direction of j (current density) changes in an exact manner, while die current/remain unaffected. The agent that is essentially responsible for is
   (a) source of emf.
   (b) electric field produced by charges accumulated on the surface of wire.
   (c) the charges just behind a given segment of wire which push them just the right way by repulsion.
   (d) the charges ahead.
2. Two batteries of ε_1 and ε_2 ($\varepsilon_2 > \varepsilon_1$) and internal resistance r_1 and r_2 respectively are connected in parallel as shown in figure.



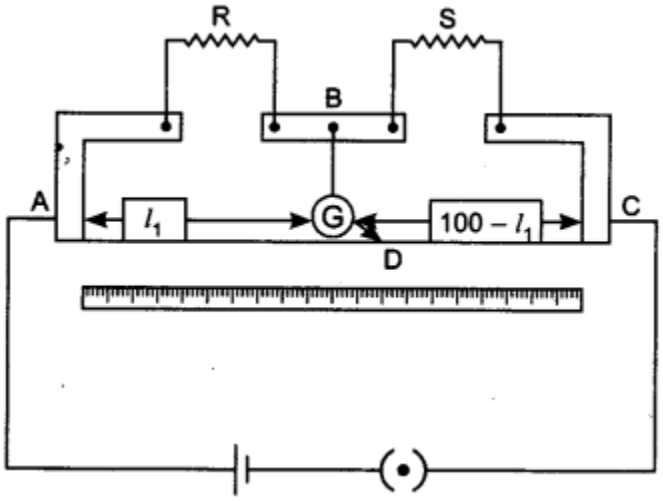
(a) The equivalent emf ε_{eq} of the two cells is between ε_1 and ε_2 i.e. $\varepsilon_1 < \varepsilon_{eq} < \varepsilon_2$.
(b) The equivalent emf ε_{eq} is smaller than ε_1.
(c) The equivalent is given by $\varepsilon_{eq} = \varepsilon_1 + \varepsilon_2$ always.
(d) zero is independent of internal resistances r_1 and r_2.

3. A resistance R is to be measured using a meter bridge. Student chooses the standard resistance S to be 100 Ω He finds the null point at l_1 = 2.9 cm. He is told to attempt to improve the accuracy. Which of the following is a useful way?
(a) He should measure l_1 more accurately.
(b) He should change Sto 1000 Ω and repeat the experiment.
(c) He should change S to 3 Ω and repeat the experiment.
(d) He should give up hope of a more accurate measurement with a meter bridge.
4. Two cells of emf's approximately 5 V and 10 V are to be accurately compared using a potentiometer of length 400 cm.
(a) The battery that runs the potentiometer should have voltage of 8 V.
(b) The battery of potentiometer can have a voltage of 15 V and R adjusted so that the potential drop across the wire slightly exceeds 10 V.
(c) The first portion of 50 cm of wire itself should have a potential drop of 10 V.
(d) Potentiometer is usually used for comparing resistances and not voltages.
5. Consider a simple circuit shown in figure stands for a variable resistance R'. R' can vary from R_0 to infinity, r is internal resistance of the battery ($r << R << R_0$).



(a) Potential drop across AB is not constant as R_0 is varied.
(b Current through R0 is nearly a constant as R_0 is varied.
(c) Current I depends sensitively on R_0.
(d) $I \geq \frac{V}{r+R}$ always.

6. In a meter bridge, the point D is a neutral point (figure).

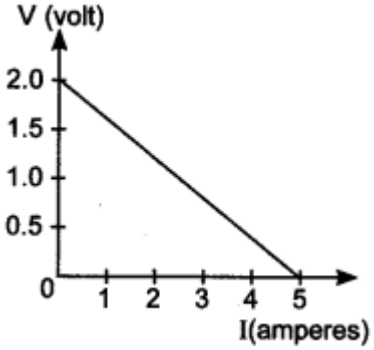


(a) The meter bridge can have other neutral point for this set of resistances.
(b) When the jockey contacts a point on meter wire left of D, current flows to B from the wire.
(c) When the jockey contacts a point on the meter wire to the right of D, current flows from B to the wire through galvanometer.
(d) When R is increased, the neutral point shifts to left.

7. Which of the following is wrong? Resistivity of a conductor is
(a) independent of temperature.
(b) inversely proportional to temperature.
(c) independent of dimensions of conductor.
(d) less than resistivity of a semiconductor.

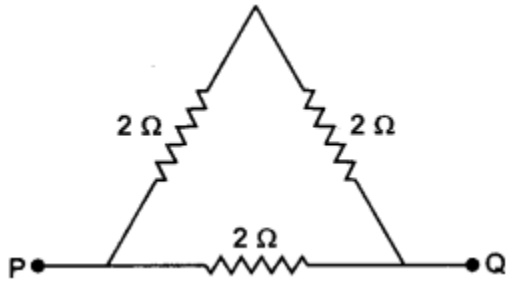
8. Drift velocity vd varies with the intensity of electric field as per the relation
(a) $v_d \propto E$
(b) $v_d \propto \frac{1}{E}$
(c) v_d = constant
(d) $v_d \propto E^2$

9. For a cell, the graph between the potential difference (V) across the terminals of the cell and the current (I) drawn from the cell is shown in the figure.

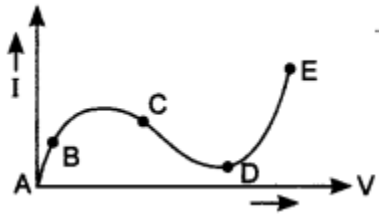


The e.m.f. and the internal resistance of the cell are
(a) 2V, 0.5 Ω
(b) 2V, 0.4 Ω
(c) > 2V, 0.5 Ω
(d) > 2V, 0.4 Ω

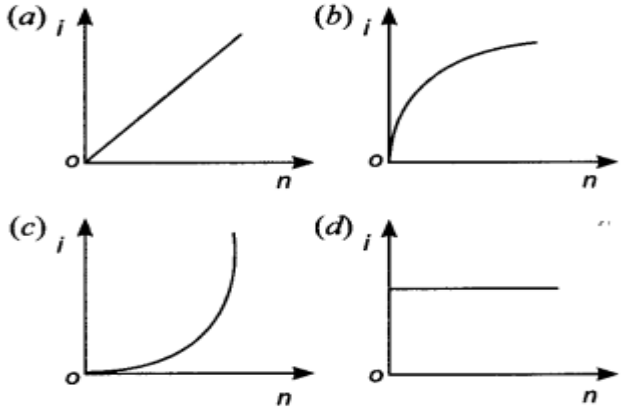
10. When there is an electric current through a conducting wire along its length, then an electric field must exist
    (a) outside the wire but normal to it.
    (b) outside the wire but parallel to it.
    (c) inside the wire but parallel to it.
    (d) inside the wire but normal to it.
11. Three resistors each of 2 ohm are connected together in a triangular shape. The resistance between any two vertices will be



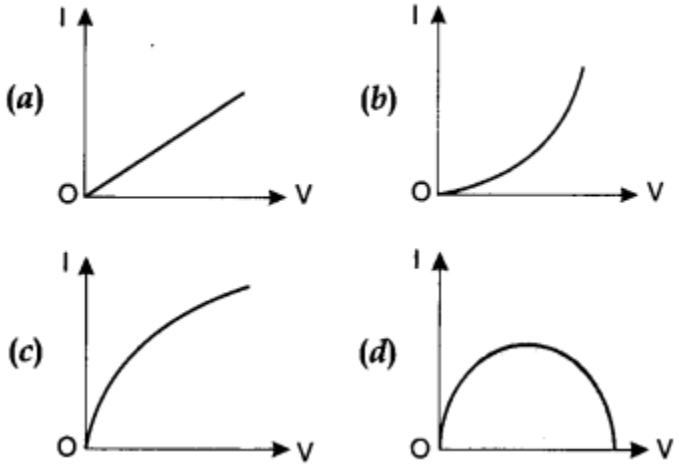
    (a) 4/3 ohm
    (b) 3/4 ohm
    (c) 3 ohm
    (d) 6 ohm
12. From the graph between current I and voltage V shown below, identify the portion corresponding to negative resistance



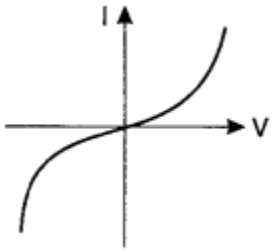
    (a) AB
    (b) BC
    (c) CD
    (d) DE
13. A battery consists of a variable number V of identical cells having internal resistances connected in series. The terminals of battery are short circuited and the current i is measured. Which of the graph below shows the relationship between i and n?



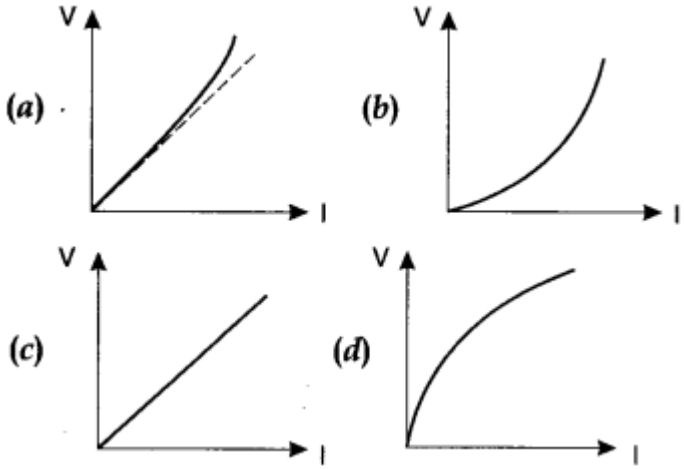
14. A charge is moving across a junction, then
    (a) momentum will be conserved.
    (b) momentum will not be conserved.
    (c) at some places momenturii will be conserved and at some other places momentum will not be conserved.
    (d) none of these.
15. Which of the following I-V graph represents ohmic conductors?



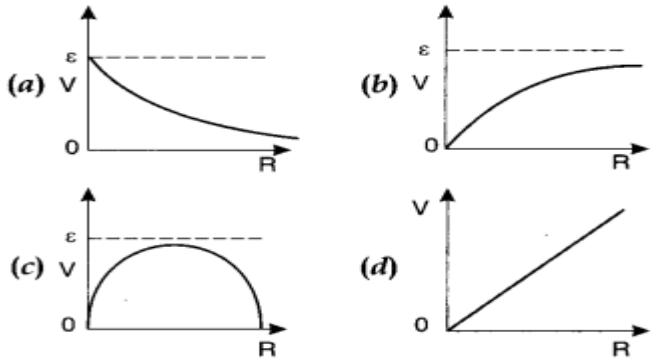
16. The I-V characteristics shown in figure represents



    (a) ohmic conductors
    (b) non-ohmic conductors
    (c) insulators
    (d) superconductors
17. Which of the following is correct for V-I graph of a good conductor?



18. The resistivity of alloy manganin is
    (a) Nearly independent of temperature
    (b) Increases rapidly with increase in temperature
    (c) Decreases with increase in temperature
    (d) Increases rapidly with decrease in temperature
19. An electric heater is connected to the voltage supply. After few seconds, current gets its steady value then its initial current will be
    (a) equal to its steady current
    (b) slightly higher than its steady current
    (c) slightly less than its steady current
    (d) zero
20. In the series combination of two or more than two resistances
    (a) the current through each resistance is same.
    (b) the voltage through each resistance is same.
    (c) neither current nor voltage through each re-sistance is same.
    (d) both current and voltage through each resis¬tance are same.
21. Combine three resistors 5 Q, 4.5 Q and 3 Q in such a way that the total resistance of this combination is maximum
    (a) 12.5 Q
    (b) 13.5 Q
    (c) 14.5 Q
    (d) 16.5 Q
22. A cell having an emf E and internal resistance r is connected across a variable external resistance R. As the resistance R is increased, the plot of potential difference V across R is given by



23. In parallel combination of n cells, we obtain
    (a) more voltage
    (b) more current
    (c) less voltage
    (d) less current
24. If n cells each of emf e and internal resistance r are connected in parallel, then the total emf and internal resistance will be

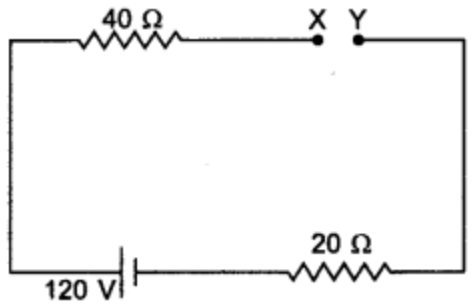
    (a) $\varepsilon, \frac{r}{n}$ **(b)** ε, nr

    (d) $n\varepsilon, \frac{r}{n}$ **(d)** $n\varepsilon, nr$

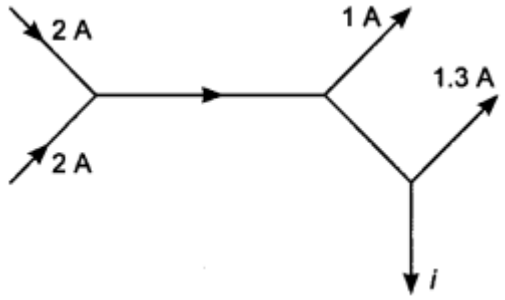
25. In a Wheatstone bridge if the battery and galvanometer are interchanged then the deflection in galvanometer will

(a) change in previous direction
(b) not change
(c) change in opposite direction
(d) none of these.

26. When a metal conductor connected to left gap of a meter bridge is heated, the balancing point
(a) shifts towards right
(b) shifts towards left
(c) remains unchanged
(d) remains at zero
27. There are n similar conductors each of resistance R. The resultant resistance comes out to be x when connected in parallel. If they are connected in series, the resistance comes out to be _____ .
28. In the circuit shown, potential difference between X and Y is _____ and across 40 Ω is _____ .

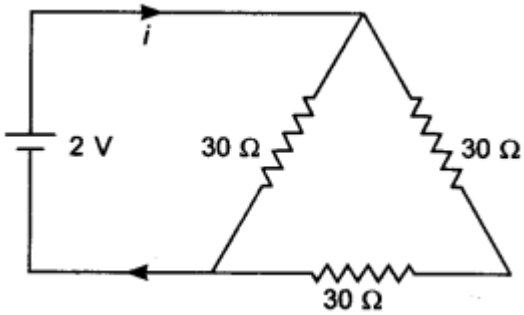


29. The figure below shows currents in a part of electric circuit. The current i is _____ .



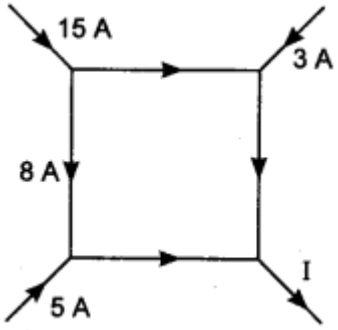
FILL IN THE BLANKS

30. A wire is stretched so as to change its length by 0.1%, the percentage increase in its resistance will be _____ .
31. The current in the given circuit will be _____ .

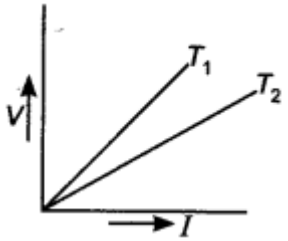


32. A cell of emf E is connected with an external resistance R, then p.d. across cell is V. The internal resistance of cell will be _____ .

33. The figure shows a network of current and the magnitude of current. The current I will be _____ .

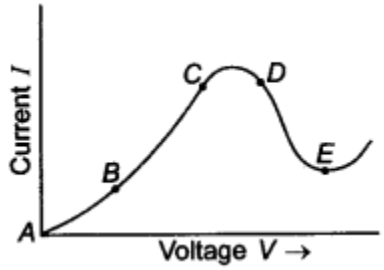


34. When electrons drift in a metal from lower to higher potential, does it mean that all the free electrons of the metal are moving in the same direction?
35. A steady current flows in a metallic conductor of non-uniform cross-section. Which of these quantities is constant along the conductor: current, current density, drift speed and electric field?
36. The electron drift arises due to the force experienced by electrons in the electric field inside the conductor. But force should cause acceleration. Why then do the electrons acquire a steady average drift speed?
37. The electron drift speed is estimated to be only a few mm s^{-1} for currents in the range of a few amperes? How then is current established almost the instant a circuit is closed?
38. Is there a net field inside the cell when the circuit is closed and a steady current passes through? Explain.
39. Plot a graph showing the variation of resistance of a conducting wire as a function of its radius, keeping the length of the wire and its temperature as constant. [Foreign 2013]
40. V-I graph for a metallic wire at two different temperatures T1 and T2 is as shown in the figure. Which of the two temperatures is higher and why?



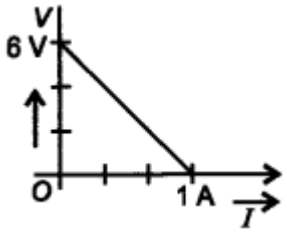
41. The emf of a cell is always greater than its terminal voltage. Why? Give reason.
42. You are given three constantan wires P, Q and R of length and area of cross-section (L, A), (2L, $\frac{A}{2}$), ($\frac{L}{2}$2A) respectively. Which has highest resistance?
43. Two wires of equal length, one of copper and the other of manganin have the same resistance. Which wire is thicker?
44. Nichrome and copper wires of same length and same radius are connected in series. Current/is passed through them. Which wire gets heated up more? Justify your answer.
45. State the condition for maximum current to be drawn from a cell.
46. State the condition under which the terminal potential difference across a battery and its emf are equal.
47. A car battery is of 12 V. Eight dry cells of 1.5 V connected in series also give 12 V, but such a combination is not used to start a car. Why?

48. Graph showing the variation of current versus voltage for a material GaAs is shown in the figure. Identify the region of



(i) negative resistance,
(ii) where Ohm's law is obeyed.

49. Define the term 'electrical conductivity' of a metallic wire. Write its SI unit.
50. Give an example of a material each for which temperature coefficient of resistivity is
(i) positive and
(ii) negative.
51. Show variation of resistivity of copper as a function of temperature in a graph.
52. Two identical cells, each of emf E, having negligible internal resistance r, are connected in parallel with each other across an external resistance R. What is the current through this resistance?
53. The plot of the variation of potential difference across a combination of three identical cells in series, versus current is as shown here. What is the emf of each cell?



54. Why resistance becomes more in series combination?
55. Why resistance becomes less in parallel combination?
56. Two similar wires of same length and same area of cross-section but of different material, having resistivity p1, and p2 are connected end to end (in series). Calculate the effective resistivity of their combination.
57. Two similar wires of same length and same area of cross-section but of different material having resistivity p1 and p2 are connected side by side i.e. in parallel. Calculate the effective resistivity of their combination.
58. In an experiment on meter bridge, if the balancing length AC is x, what would be its value, when the radius of the meter bridge wire AB is doubled? Justify your answer.
59. A cell of negligible internal resistance is connected in series to the wire of a potentiometer. If potentiometer wire is changed and in its place another wire of different material having diameter twice of the first wire is used keeping the length constant, then how the balance point will change?