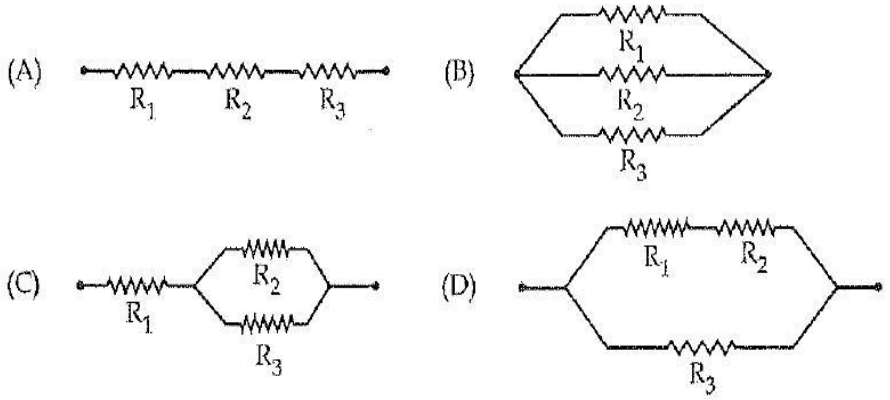
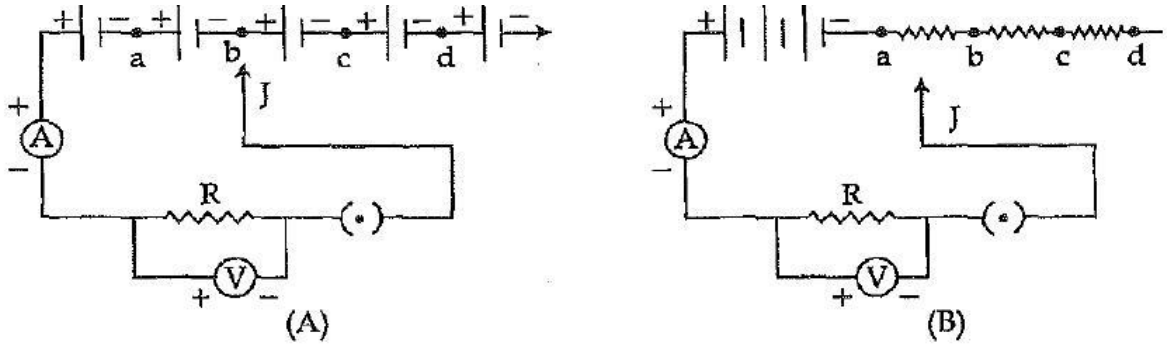
Answer the following questions:

1. In a voltmeter space between IV and 2V marks has been divided into 20 equal parts. The least count of the voltmeter is
   (a)0.025 V (b) 0.05 V (c) 0.1 V (d) 0.2 V
2. A voltmeter had graduation 0, 0.5,1.0 and 1.5 . A student noticed that the pointer of the voltmeter was indicating the third graduation mark after a mark even when the circuit was open. The space between a mark and 0.5 mark was divided into 10 equal divisions. The zero error in the voltmeter was
   (a)+ 0.3 V (b) + 0.15 V (c) - 0.15 V (d) - 0.30 V
3. While determining the equivalent resistance of three resistors R_1 R_2 and R_3 when connected in a parallel arrangement, four students A, B, C and D connected the resistors as follows:



   The correct arrangement of resistors is that of student:
   (a)A (b) B (c) C (d) D
4. In the experiment on finding the equivalent resistance of two resistors, connected in series, a student connects the terminals of a voltmeter to :
   (a)One terminal of each of the two resistors and these terminals are not interconnected
   (b)One terminal of each of the two resistors and these terminals are also interconnected.
   (c)both the terminals of each of two resistors.
   (d)both the terminals of one resistor and one terminal of the other resistor.
5. To study the dependence of current (I) on the potential difference (V) across a resistor R, two students used the two set ups shown in figure A and B respectively. They kept the contact point J in four different positions marked, (a), (b), (c), (d), in the two figures



For the two students the ammeter and voltmeter readings will be maximum when the contact J is in the position:

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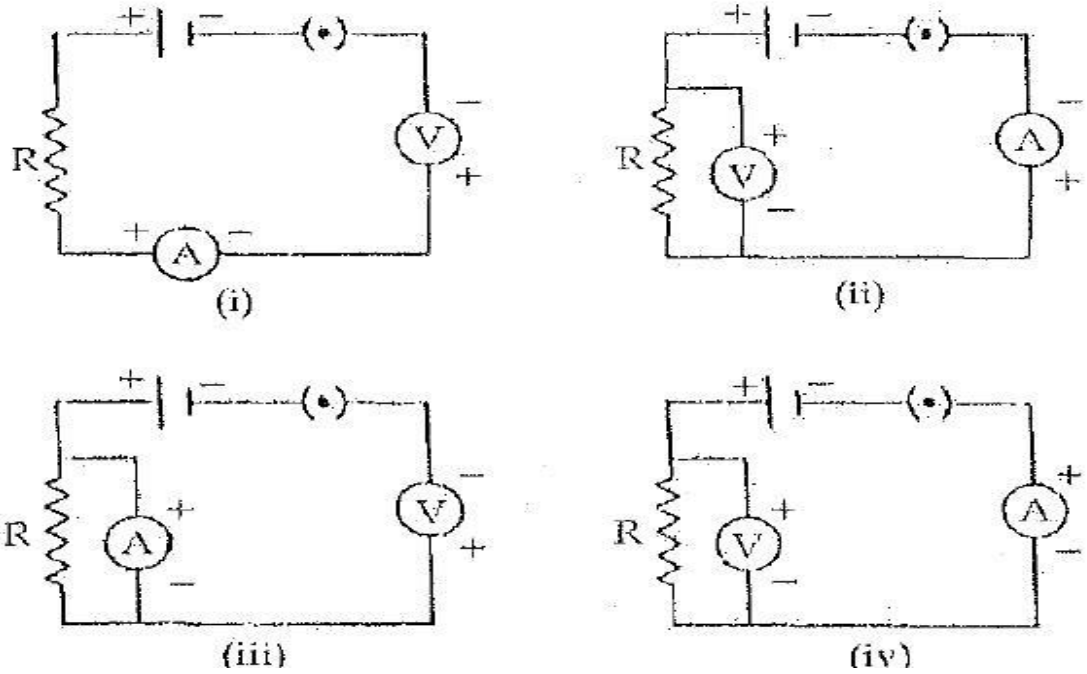
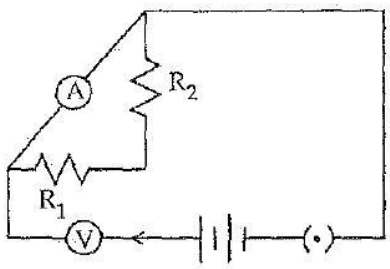
(a) d in both the set ups.
(b)a in both the set ups .
(c) d in set up A and a in set up B.
(d) a in set up A and d in set up B.

6. Identify the circuit diagram in which the electrical components have been properly connected.



(i) b (ii) (c) (iii) (d) (iv)

7. For carrying out the experiment, on finding tile equivalent resistance of two resistors connected in series, a student sets up the circuit as shown. On further verification he finds out that the circuit has one or more of tile following faults.



(i)The resistors Rl and R2 have not been correctly connected in series.
(ii)The voltmeter has not been correctly connected in the circuit.
(iii) The ammeter has not been correctly connected in the circuit.
Out of these three, the actual fault in the circuit is/are:

(a)both (i) and (ii)
(b)both (ii) and (iii)
(c) only (i)
(d)only (ii)

8. Which of the following experimental set up is correct for verification of Ohm's law?

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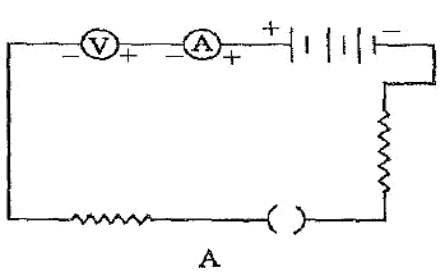
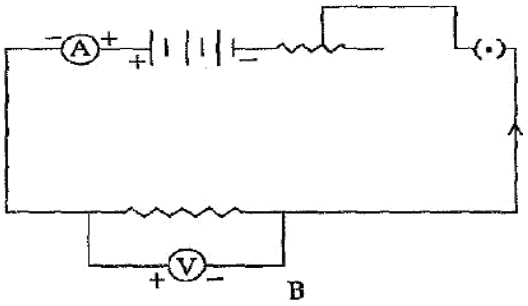
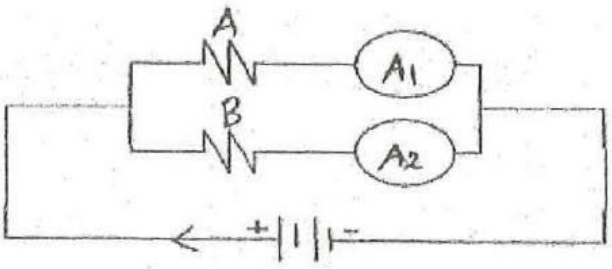




(a)A
(b) B
(c) both A and B
(d)Neither A nor B

9. State the right hand thumb rule?
10. Four resistors of 2 n each are joined end to end to form a square ABCD. Calculate the equivalent resistance of the combination between any two adjacent corners.
11. What is meant by the statement that the potential difference between two points is 1 volt ?
12. Name the instruments used for measuring electric current and potential difference. Draw a circuit diagram to show how these two are connected in an electric circuit.
13. What is an electric fuse? State it's function in a circuit.
14. List two reasons which limit the usage of solar cells for harnessing energy for domestic use.
15. In the circuit diagram shown, the two resistance wires A and B are of same area of cross section and same material, but A is longer than B. Which ammeter A_1 or A_2 will indicate higher reading for current? Give reason.



16. What will be the direction of the deflection of the magnetic needle when current carrying conductor is placed perpendicular to the axis of the needle? Give reason to support your answer.
17. What are the factors that should be taken into consideration for selecting a source of energy .List any three.
18. 12. A 400W refrigerator operates for 16 h per day. Calculate the cost to operate it for 30 days at Rs 3.40 per kWh.
19. Two resistors of 10 Ω and 20 Ω are connected in series to a 20 V battery. Calculate the potential difference across the 10 Ω resistor.
20. (a)What is the function of an earth wire? Why is it necessary to earth metallic appliances?
    (b)What is the difference between overloading and short circuiting?
21. An electric bulb is rated 220 V and 100 W.
    a. Find its resistance.
    b. Calculate the energy consumed by bulb in a month of 30 days if it operated on 220 V daily for 10 hours. Find the cost of energy consumed at the rate of Rs 5/ - per unit of electricity.
22. Describe an activity to show the variation of resistance on material of the conductor.
23. List three major hazards of nuclear power generation.
24. What is electromagnetic induction? State the rule used to find the direction of induced current in a moving conductor in a magnetic field. Under what orientation

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the induced current produced in moving conductor in a magnetic field be maximum ?

25. Three resistors of resistances R_1,R_2 and R_3 are connected in parallel to a source of potential difference V. Draw the schematic circuit diagram. Find the equivalent resistance of the circuit. What is the advantage of parallel circuit in electrical gadgets.
26. What is heating effect of electric current? Derive an expression for amount of heat produced in time t in a resistor R when voltage drop across it is V. Mention one application of heating effect of electric current.
27. Define a magnetic field line. Two field lines cannot intersect each other why? Draw the pattern of magnetic field lines for a current carrying circular loop. On what factors magnetic field at the centre of current carrying circular loop depends?
28. Draw the pattern of magnetic field produced by a current carrying solenoid. How is the magnetic field inside a current carrying solenoid used to make an electromagnet? Explain with the help of diagram. List two factors on which the strength of magnetic field produced by a current carrying solenoid depends.
29. (a) Name the scientist who discovered that a moving magnet can be used to generate electric current. With which name is this phenomenon known?

(b) Two coils 1 and 2 of insulated copper wire having large but different number of turns are wound over a cardboard cylinder. Coil 1 is connected to battery and a plug key. Coil 2 is connected to a galvanometer. How will the galvanometer reading change when?

(i) key is plugged in, and (ii) key is taken out.
Give reason for your answer.

(c) Name and state the rule used for determination of direction of induced current due to a changing magnetic field and give one practical application of this phenomenon in everyday life.

30. (a) Consider a circular loop of wire lying in the plane of the paper. Let the current pass through the loop clockwise. With the help of a diagram explain how the direction of the magnetic field can be determined inside and outside the loop. Name the law used to find the direction of magnetic field.

(b) Draw a diagram to represent a uniform magnetic field in a given region.

(c)List two properties of magnetic field lines.

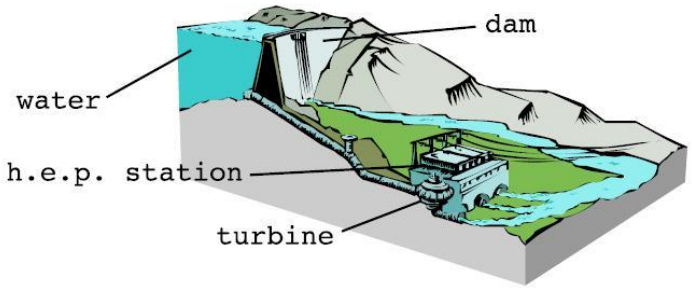
Skill Questions:

Read the following information and answer the questions which follow:

1. Hydroelectric Power

A hydroelectric power (or h.e.p) station harnesses the energy of water as it runs downhill, and uses it to generate electrical energy. Water gains energy when rain falls on highlands. Dams are used to collect this water, which is then allowed to run downhill through the turbines in an h.e.p. station.

Rain falls from clouds, which are formed when water vapour condenses to form huge numbers of tiny drops. The water vapour rises from the oceans and land that has been warmed by absorbing the sun's radiant energy.



(i) What kind of energy does water have at the top of a hill?

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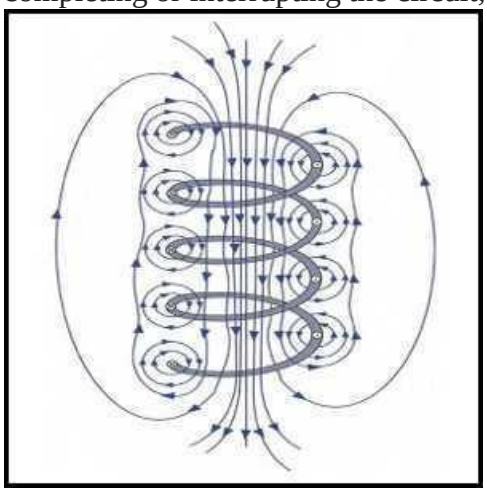
(ii) H.e.p. makes use of a renewable resource .Describe the practical uses of H.e.p.. List their relative advantages and limitations.

2. Electric current is expressed by the amount of charge flowing through a particular area in unit time.
(i)(a)State an equation which relates voltage, current and resistance.
(b) There is an electric current in a copper wire.
(ii) Complete the sentence.
This electric current is the rate of flow of .....
(iii) The copper wire is replaced by an aluminium wire.
This wire has the same thickness and the same length but a greater resistance. What effect, if any, does this have on the electric current?

3. An electromagnet consists of a length of conductive wire, usually copper, wrapped around a piece of metal. A current is introduced, either from a battery or another source of electricity, and flows through the wire. This creates a magnetic field around the coiled wire, magnetizing the metal as if it were a permanent magnet. Electromagnets are useful because you can turn the magnet on and off by completing or interrupting the circuit, respectively.



(i) Which of the following is used to make an electromagnet?
(Soft iron ,aluminum)

(ii)If current through an electromagnet is stopped, what happens? Why?

(iii)Is it possible to change the polarity of an electromagnet? How?

(iv)What is the name for the current which reverses it's direction? How is it advantageous over the other type of current?

(v)What is the advantage of using electromagnets instead of permanent magnets in motors?

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