

- Choose the incorrect statement from the following regarding magnetic lines of field
 - The direction of magnetic field at a point is taken to be the direction in which the north pole of a magnetic compass needle points
 - Magnetic field lines are closed curves
 - If magnetic field lines are parallel and equidistant, they represent zero field strength
 - Relative strength of magnetic field is shown by the degree of closeness of the field lines
- If the key in the arrangement (Figure 13.1) is taken out (the circuit is made open) and magnetic field lines are drawn over the horizontal plane ABCD, the lines are

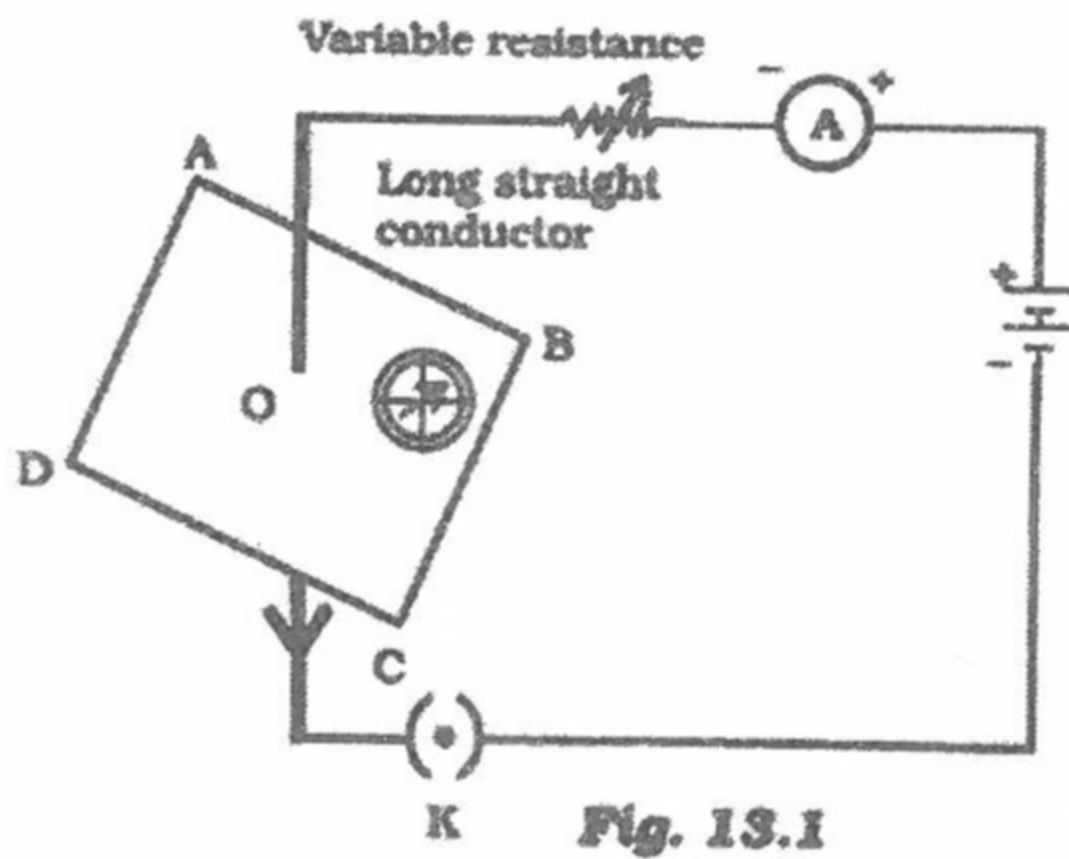


Fig. 13.1

- concentric circles
 - elliptical in shape
 - straight lines parallel to each other
 - concentric circles near the point O but of elliptical shapes as we go away from it
- A circular loop placed in a plane perpendicular to the plane of paper carries a current when the key is ON. The current as seen from points A and B (in the plane of paper and on the axis of the coil) is anti clockwise and clockwise respectively. The magnetic field lines point from B to A. The N-pole of the resultant magnet is on the face close to

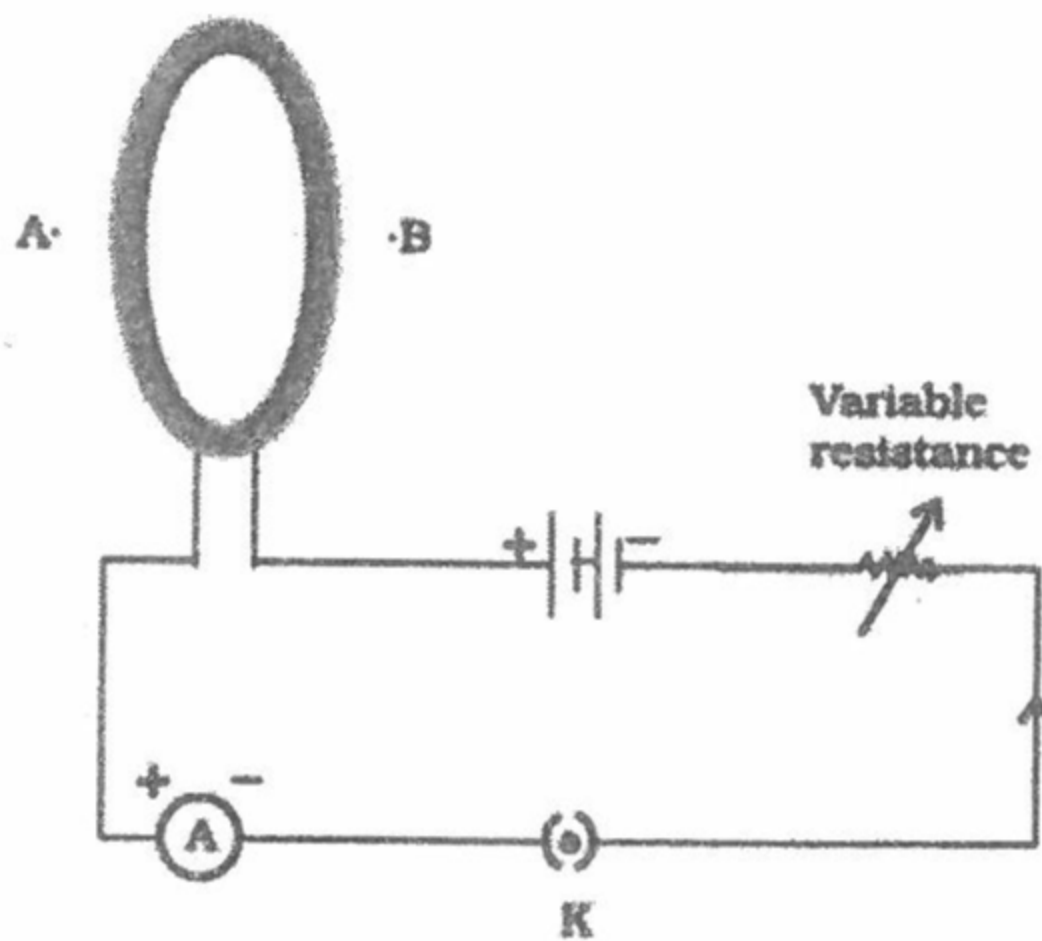


Fig. 13.2

- A
 - B
 - A if the current is small, and B if the current is large
 - B if the current is small and A if the current is large.
- For a current in a long straight solenoid N- and S-poles are created at the two ends. Among the following statements, the incorrect statement is
 - The field lines inside the solenoid are in the form of straight lines which indicates that the magnetic field is the same at all points inside the solenoid
 - The strong magnetic field produced inside the solenoid can be used to magnetise a piece of magnetic material like soft iron, when placed inside the coil
 - The pattern of the magnetic field associated with the solenoid is different from the pattern of the magnetic field around a bar magnet
 - The N- and S-poles exchange position when the direction of current through the solenoid is reversed.
 - Two resistors of resistance $2\ \Omega$ and $4\ \Omega$ when connected to a battery will have
 - same current flowing through them when connected in parallel
 - same current flowing through them when connected in series
 - same potential difference across them when connected in series
 - different potential difference across them when connected in parallel
 - Unit of electric power may also be expressed as
 - volt ampere
 - kilowatt hour
 - watt second
 - joule second

7. Uniform magnetic field exists in the plane of paper pointing from left to right as shown in Figure 13.3. In the field an electron and a proton move as shown. The electron and the proton experience

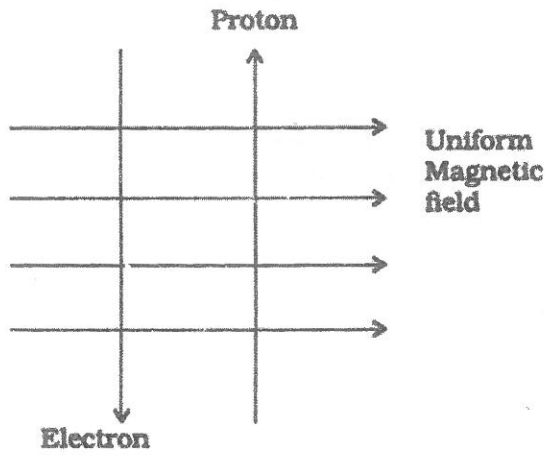


Fig. 13.3

- (a) forces both pointing into the plane of paper (b) forces both pointing out of the plane of paper
 (c) forces pointing into the plane of paper and out of the plane of paper, respectively
 (d) force pointing opposite and along the direction of the uniform magnetic field respectively
8. Commercial electric motors do not use
- (a) an electromagnet to rotate the armature (b) effectively large number of turns of conducting wire in the current carrying coil (c) a permanent magnet to rotate the armature (d) a soft iron core on which the coil is wound
9. In the arrangement shown in Figure 13.4 there are two coils wound on a non-conducting cylindrical rod. Initially the key is not inserted. Then the key is inserted and later removed. Then

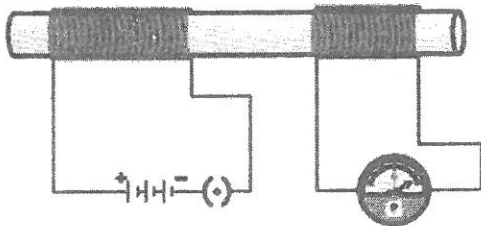


Fig. 13.4

- (a) the deflection in the galvanometer remains zero throughout
 (b) there is a momentary deflection in the galvanometer but it dies out shortly and there is no effect when the key is removed
 (c) there are momentary galvanometer deflections that die out shortly; the deflections are in the same direction
 (d) there are momentary galvanometer deflections that die out shortly; the deflections are in opposite directions
10. Choose the incorrect statement
- (a) Fleming's right-hand rule is a simple rule to know the direction of induced current
 (b) The right-hand thumb rule is used to find the direction of magnetic fields due to current carrying conductors
 (c) The difference between the direct and alternating currents is that the direct current always flows in one direction, whereas the alternating current reverses its direction periodically
 (d) In India, the AC changes direction after every 1 / 50 second
11. A constant current flows in a horizontal wire in the plane of the paper from east to west as shown in Figure 13.5. The direction of magnetic field at a point will be North to South

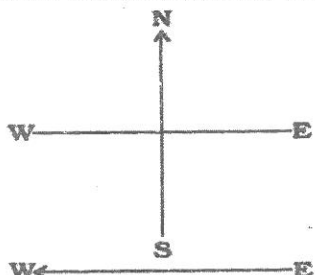
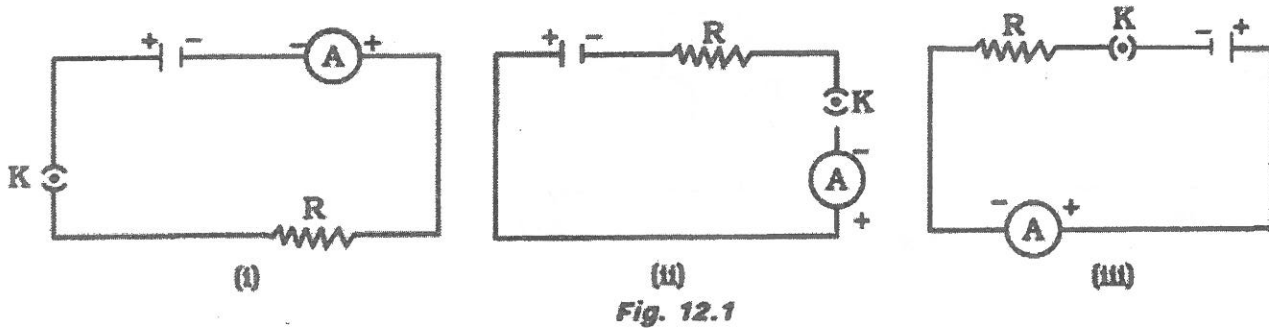


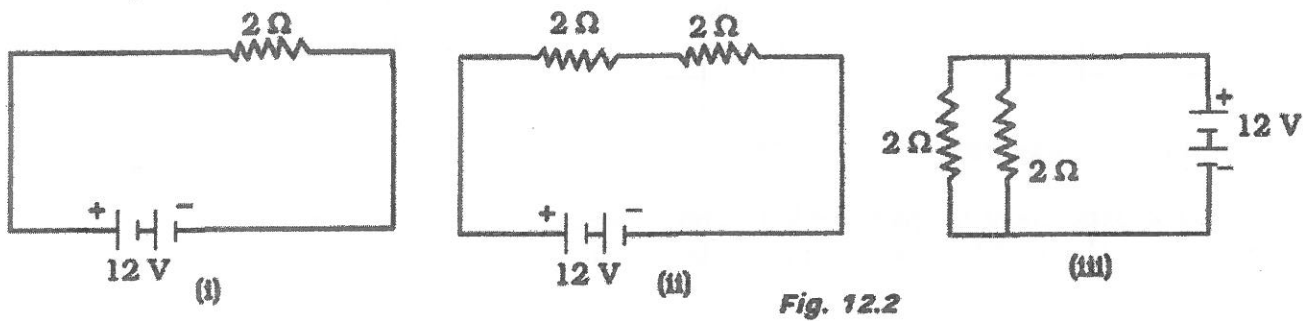
Fig. 13.5

- (a) directly above the wire (b) directly below the wire (c) at a point located in the plane of the paper, on the north side of the wire (d) at a point located in the plane of the paper, on the south side of the wire

12. The strength of magnetic field inside a long current carrying straight solenoid is
 (a) more at the ends than at the centre (b) minimum in the middle (c) same at all points (d) found to increase from one end to the other
13. To convert an AC generator into DC generator
 (a) split-ring type commutator must be used (b) slip rings and brushes must be used (c) a stronger magnetic field has to be used (d) a rectangular wire loop has to be used
14. The most important safety method used for protecting home appliances from short circuiting or overloading is
 (a) earthing (b) use of fuse (c) use of stabilizers (d) use of electric meter
15. A cell, a resistor, a key and ammeter are arranged as shown in the circuit diagrams of Figure 12.1. The current recorded in the ammeter will be



- (a) maximum in (i) (b) maximum in (ii) (c) maximum in (iii) (d) the same in all the cases
16. In the following circuits (Figure 12.2), heat produced in the resistor or combination of resistors connected to a 12 V battery will be



- (a) same in all the cases (b) minimum in case (i) (c) maximum in case (ii) (d) maximum in case (iii)
17. Electrical resistivity of a given metallic wire depends upon
 (a) its length (b) its thickness (c) its shape (d) nature of the material
18. A current of 1 A is drawn by a filament of an electric bulb. Number of electrons passing through a cross section of the filament in 16 seconds would be roughly
 (a) 10^{20} (b) 10^{16} (c) 10^{18} (d) 10^{23}
19. What is the maximum resistance which can be made using five resistors each of $1/5 \Omega$?
 (a) $1/5 \Omega$ (b) 10Ω (c) 5Ω (d) 1Ω
20. What is the minimum resistance which can be made using five resistors each of $1/5 \Omega$?
 (a) $1/5 \Omega$ (b) $1/25 \Omega$ (c) $1/10 \Omega$ (d) 25Ω
21. A cylindrical conductor of length l and uniform area of cross section A has resistance R . Another conductor of length $2l$ and resistance R of the same material has area of cross section
 (a) $A/2$ (b) $3A/2$ (c) $2A$ (d) $3A$
22. In an electrical circuit two resistors of 2Ω and 4Ω respectively are connected in series to a 6 V battery. The heat dissipated by the 4Ω resistor in 5 s will be
 (a) 5 J (b) 10 J (c) 20 J (d) 30 J
23. An electric kettle consumes 1 kW of electric power when operated at 220 V. A fuse wire of what rating must be used for it?
 (a) 1 A (b) 2 A (c) 4 A (d) 5 A

24. Identify the circuit (Figure 12.3) in which the electrical components have been properly connected.

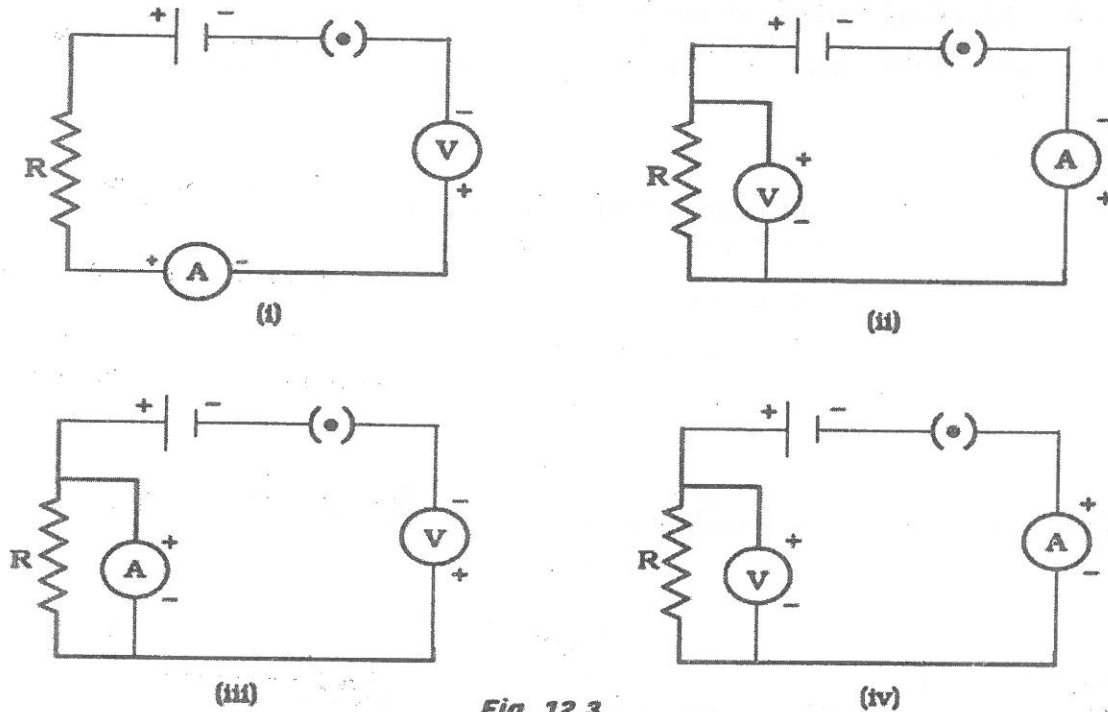


Fig. 12.3

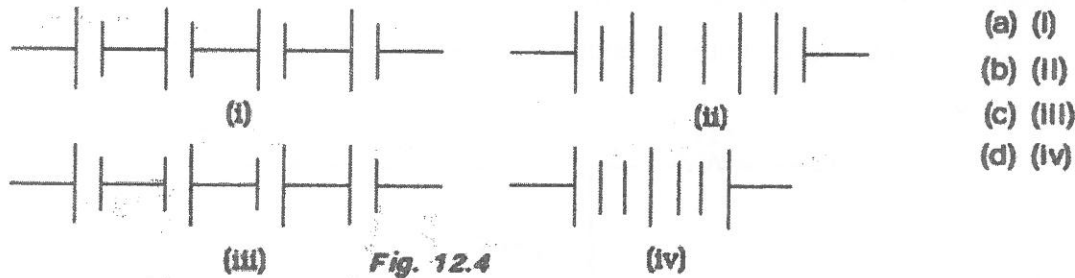
(c) (iii)

(d) (iv)

(a) (i)

(b) (ii)

25. The proper representation of series combination of cells (Figure 12.4) obtaining maximum potential is



(a) (i)

(b) (ii)

(c) (iii)

(d) (iv)

Fig. 12.4

26. A student carries out an experiment and plots the V-I graph of three samples of nichrome wire with resistances R_1 , R_2 and R_3 respectively (Figure.12.5). Which of the following is true?

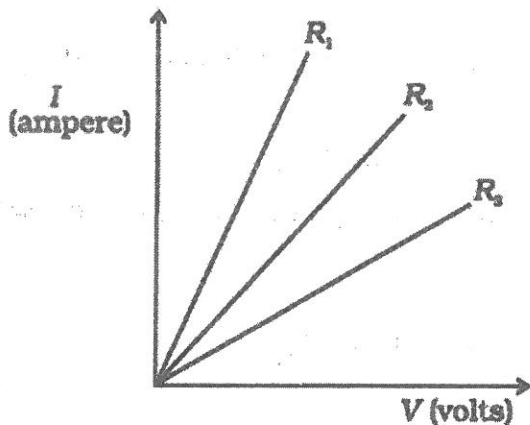


Fig. 12.5

(a) $R_1 = R_2 = R_3$ (b) $R_1 > R_2 > R_3$ (c) $R_3 > R_2 > R_1$ (d) $R_2 > R_3 > R_1$

27. If the current I through a resistor is increased by 100% (assume that temperature remains unchanged), the increase in power dissipated will be

(a) 100 % (b) 200 % (c) 300 % (d) 400 %

28. The resistivity does not change if

(a) the material is changed (b) the temperature is changed (c) the shape of the resistor is changed

(d) both material and temperature are changed

29. In an electrical circuit three incandescent bulbs A, B and C of rating 40 W, 60 W and 100 W respectively are connected in parallel to an electric source. Which of the following is likely to happen regarding their brightness?

(a) Brightness of all the bulbs will be the same (b) Brightness of bulb A will be the maximum (c) Brightness of bulb B will be more than that of A (d) Brightness of bulb C will be less than that of B