APPSTF - Dr. B R AMBEDKAR KONASEEMA

10th PS, SAMP-3 MODEL PAPER-1

Marks:35 2025-26

I. Answer the following questions . 7×1=7M

1. Which of the following properties of a proton can change while it moves freely in a magnetic field?

i) mass ii) speed iii) velocity iv) Momentum

Choose correct option (C)

A)i and ii B) ii and iii

C) iii and iv D) iv and i

2.At the time of short circuit, the current in the circuit (c)

a) reduces substantially b)does not change

c)increase heavily

d)vary continuously

3) 1KW =-----watts.

Ans) 1000

4) Name the safety measures commonly used in electric circuits and appliances.

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A) i) using electric fuse or MCB

ii) Earthing.

5.State whether the following statement is true or false.

" The field at the centre of a long circular coil carrying current will be parallel straight lines".

Ans) True

6.A positively charged particle (Alpha particle) projected towards west is deflected towards north by a magnetic field the direction of magnetic field is (d)

a) towards south b) towards east

c) downward d) upward

7. Who identified initially that "current carrying conductor acts as a magnet." ?

Ans) Oersted

II. Answer the following questions . 4×2=8M

8.State Fleming's right hand rule.

Ans) It state that if we arrange our thumb forefinger and middle finger of the right hand perpendicular to each other, then the thumb points towards the direction of the motion of the conductor, forefinger points towards the direction of the magnetic field and the middle finger points towards the direction of the induced current.

89.Why don't two magnetic field lines intersect each other?

A. Because, if they intersect, it would mean that at the point of intersection, the magnetic field has two different directions. Which is impossible.

10.When does an electric short circuit occur?

Ans: When live wire and neutral wire come into contact an electric short circuit occurs.

11.Why does a compass needle get deflected when brought near a bar magnet?

Ans: A compass needle is itself a tiny magnet when brought near a bar magnet, the magnetic field of the bar magnet exerts a force on the compass needle, causing it to align with the bar magnet's field. This results in deflection.

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III. Answer the following questions . 3×4=12M

12 i)State the rule to determine the direction of a magnetic field produced around a straight conductor carrying current.

ii) State the rule to determine the direction of a force experienced by a current carrying straight conductor placed in a magnetic field which is perpendicular to it. And

iii)State the rule to determine the direction of a current induced in a coil due to its rotation in a magnetic field.

iv) Name the magnetic device which is used to draw magnetic field lines around a bar magnet

Ans: i)Right hand thumb rule

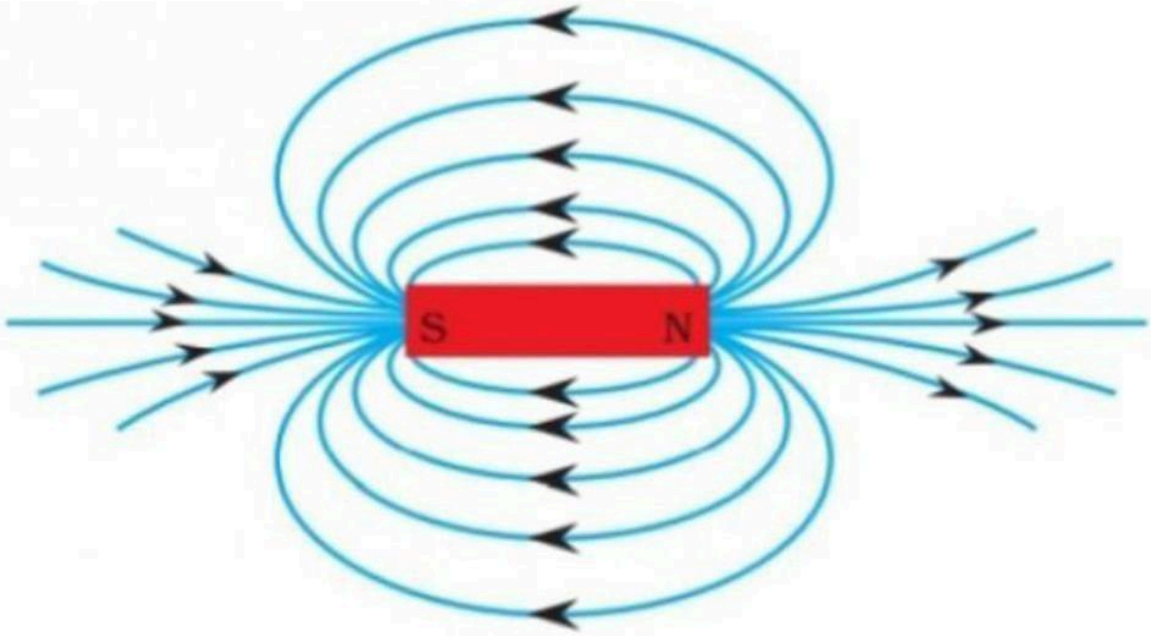
(ii) Flemings's left hand rule

(iii) Flemings's right hand rule

iv) magnetic compass.

13.Draw magnetic field lines around a bar magnet.

Ans:



Field lines around a bar magnet

14.An electric oven of 2 KW power rating is operated in a domestic electric circuit (220 v) that has a current rating of 5A. What result do you expect? Explain.

Ans) Current = Power/voltage

I = P/V

= 2kW /220V

= 9.1A > 5A

So the result is overload and hence the fuse will melt or the MCB will trip.

IV. Answer the following questions . 1×8=8M

15A) Describe an activity to show that a current carrying conductor experiences a force when placed in a magnetic field.

A. Aim: An activity to show that a current carrying conductor experiences a force when placed in a magnetic field.

Materials required: Aluminium rod of 5cm, horse shoe magnet, battery plug , key connecting wires and a rheostat.

Procedure:

1.Take a small aluminium rod AB and suspend it horizontally from a stand, as shown in figure.

(2) Place a strong horse-shoe magnet in such a way that the rod lies between the two poles with the magnetic field directed upwards.

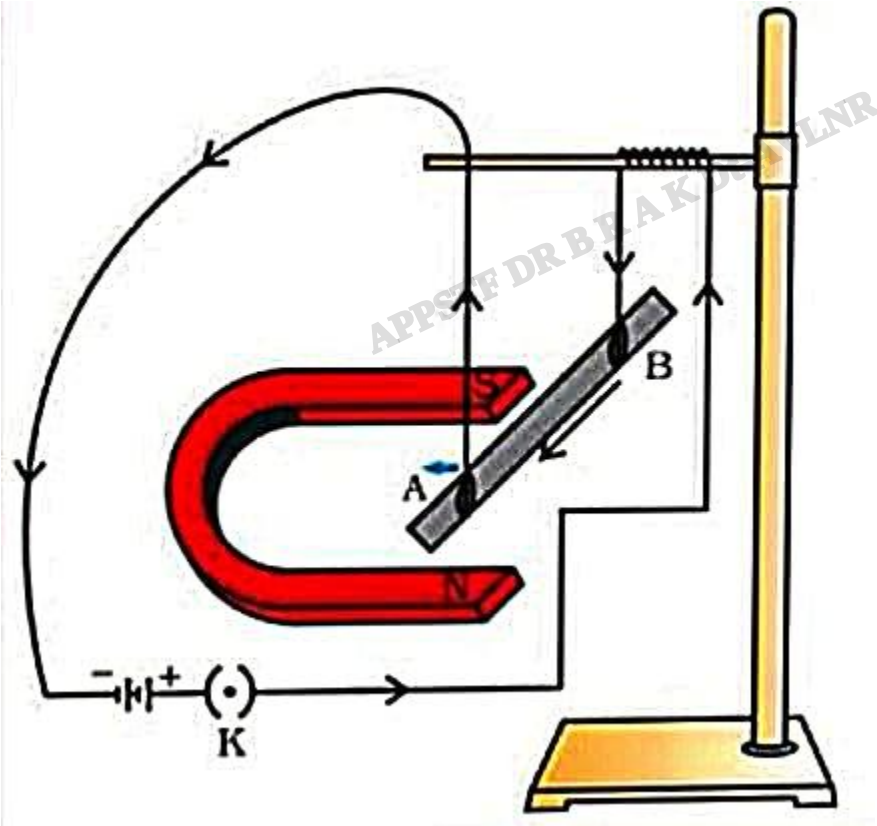
(3) Connect the aluminium rod in series with a battery, a key and a rheostat

(4) Now pass a current through the aluminium rod from end B to end A.

Observations:

i) It is observed that the rod is displaced towards the left.

(ii) If we reverse the direction of current, the rod is displaced towards the right.



Conclusion:

The displacement of the rod in the above activity suggests that a force is exerted on the current-carrying aluminium rod when it is placed in a magnetic field.

(OR)

15B)

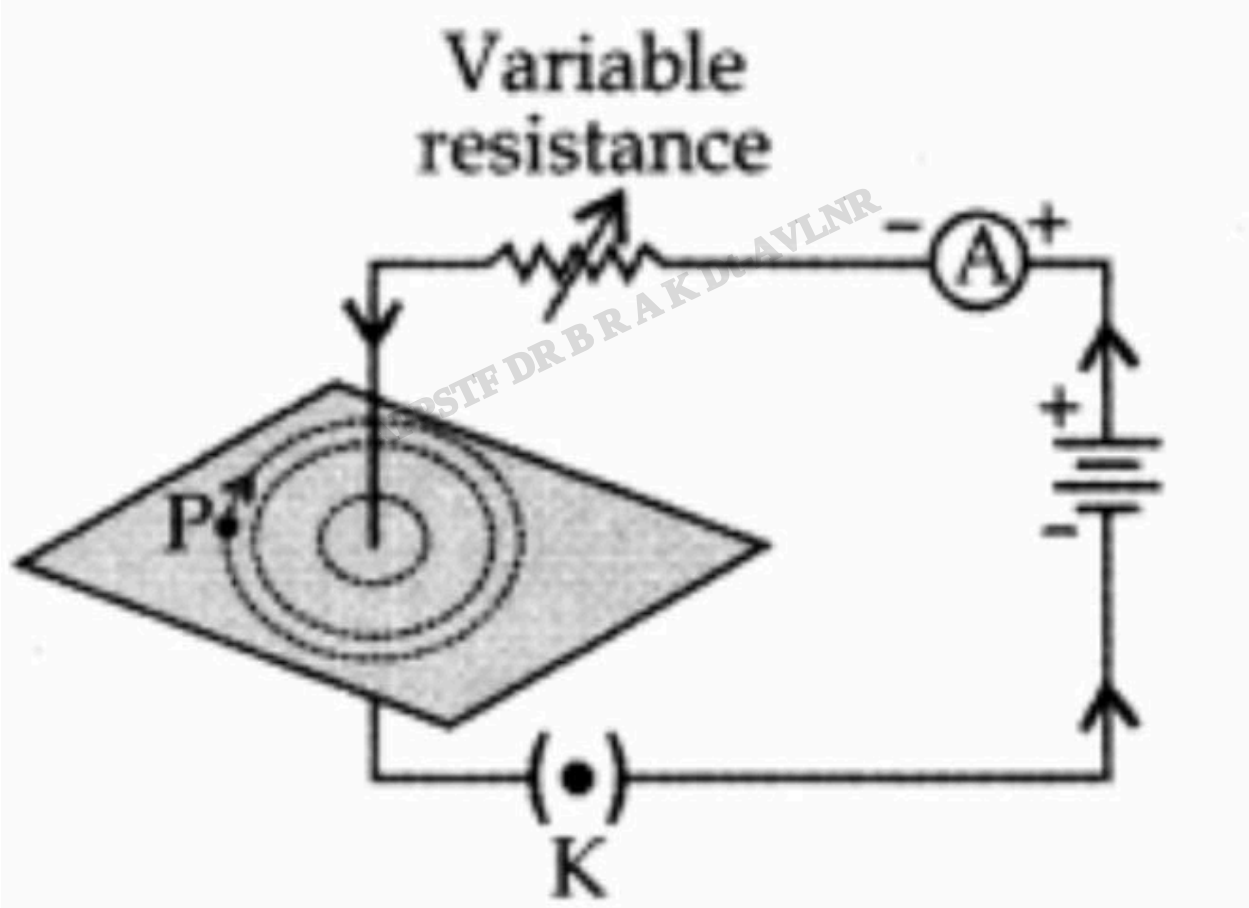
Describe an activity to show that a magnetic field is produced around a current carrying a straight conductor.

Ans :

Aim: An activity to show that magnetic field is produced around a current carrying straight
conductor.

Material required:

Battery (12 V), a variable resistance (or a rheostat), an ammeter (0-5 A), a plug key, connecting wires, a long straight thick copper wire, iron filings, compass and a card board



Procedure:

i) Insert the thick copper wire through the centre, normal to the plane of a rectangular cardboard.

(ii) Connect the copper wire vertically between the points X and Y, as shown in figure, in series with the battery, a plug and key.

(iii) Sprinkle some iron filings uniformly on the cardboard
(iv) Close the key so that a current flows through the wire.
(v) Gently tap the cardboard a few times. Observe the pattern of the iron filings.
Observation:
We can observe that the iron filings align themselves showing a pattern of concentric circles around the copper wire. They represent the magnetic field lines.
Conclusion:
The magnetic field produced around a current carrying straight conductor is in concentric circles.

AVL NARASIMHARAO, ZPPHS VODALAREVU

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