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Date: 21-01-2022

Class: 10th Genesis

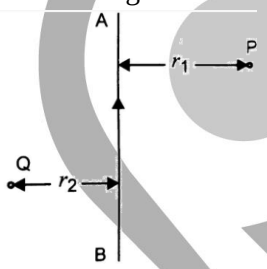
Subject: Science

Test code: SEP15(21041317)

Physics

M. Marks: 20

1. What does the divergence of magnetic field lines near the ends of a current carrying straight solenoid indicate? (1 marks)
2. Can mechanical energy be retrieved from electrical energy? (1 marks)
3. AB is a current – carrying conductor in the plane of the paper as shown in fig. What are the directions of magnetic fields produced by at points P and Q? Given $r_1 > r_2$, where will the strength of the magnetic field be larger? (2 marks)



4. It is established that an electric current through a metallic conductor produces a magnetic field around it. Is there a similar magnetic field produced around a thin beam of moving (i) alpha particles, (ii) neutrons? Justify your answer. (2 marks)
5. What is the difference between a direct current and an alternating current? How many times does AC used in India change direction in one second? (2 marks)
6. Draw the magnetic field lines around a straight conductor carrying current. Name and state the rule to find the direction of magnetic field. (2 marks)
7. Explain the phenomenon of electromagnetic induction. Describe an experiment to show that a current is set up in a closed loop when an external magnetic field passing through the loop increases or decreases. (3 marks)
8. (a) State Fleming's left hand rule. (3 marks)
   (b) Write the principle of working of an electric motor.
   (c) Explain the function of the following parts of an electric motor:
   (i) Armature (ii) Brushes (iii) Split – ring
9. A convenient method to describe the magnetic field around a magnet is to draw magnetic field lines around it. In order to do so, place a magnet on a cardboard sheet and gently sprinkle some iron fillings uniformly over it. The iron filings are found to arrange themselves in a pattern. These curved paths along which the iron filings arrange themselves due to the force acting on them in the magnetic field of the bat magnet are called magnetic field lines. (4 marks)
   (a) What is the direction of the magnetic field line?
   (b) Do magnetic field lines intersect each other?

(c) How do magnetic field lines represent a non – uniform magnetic field?
(d) How is uniform magnetic field represented by magnetic field lines?