Worksheet: Moving Charges and Magnetism

IB · Class 12 · Physics · 9 questions · 27 marks

Name: _____	Date: _____	Score: _____ / 27

Q1. A long straight wire carries a current of 10 A. Find the magnetic field at a perpendicular distance of 20 cm from it. *[2 marks]*

Q2. A circular coil of 50 turns and radius 10 cm carries a current of 2.0 A. Find the field at its centre. *[2 marks]*

Q3. A solenoid 50 cm long has 500 turns and carries 3.0 A. Find the field inside it. *[2 marks]*

Q4. A proton of speed 2.0 x 10^6 m/s enters a field of 0.50 T perpendicular to it. Find the radius of its path and its frequency. *[3 marks]*

Q5. A wire of length 25 cm carrying 4.0 A is placed at 30 degrees to a field of 0.30 T. Find the force on it. *[3 marks]*

Q6. Two long parallel wires 10 cm apart carry 5.0 A and 8.0 A in opposite directions. Find the force per metre and say whether it is attractive or repulsive. *[3 marks]*

Q7. A rectangular coil of 100 turns and area 2.0 x 10^-2 m squared carries 1.5 A in a field of 0.25 T. Find the torque when the plane of the coil is parallel to the field, and when it is perpendicular. *[4 marks]*

Q8. A galvanometer has 40 turns, area 1.8 x 10^-3 m squared, field 0.25 T and spring constant 1.0 x 10^-6 N m per radian, with resistance 20 ohm. Find its current and voltage sensitivities. *[4 marks]*

Q9. A long straight wire of radius 2.0 mm carries 8.0 A uniformly across its cross-section. Find the field at 1.0 mm from the axis. *[4 marks]*