Q.1) Select and write the correct answer.

(i) Biot-Savart law is
   a) inverse law       b) inverse square law       c) cubic law       d) converse law

(ii) A 100μA current flows through a circular coil of 500 turns and area 1.26 x 10⁻⁴ m².
     The magnetic moment of the coil is
     a) 6.3 x10⁻⁶ Am²       b) 6.3 x10⁻⁷ Am²       c) 3.6 x 10⁻⁶ Am²       d) 3.6 x10⁻⁷ Am²

(iii) For the two configurations given below, magnetic potential energy is respectively

   a) maximum and minimum       b) minimum and maximum
   c) zero and maximum         d) maximum and zero

(iv) In a moving coil galvanometer, radial magnetic field is used so that the galvanometer scale is
     a) linear       b) algebraic       c) logarithmic       d) exponential

Q.2) Answer the following.

(i) State principle of moving coil galvanometer.

     Write expression of torque acting on rotating current carrying coil in terms of its

(ii) magnetic dipole moment.

(iii) What will happen if the magnetic field in moving coil galvanometer is not radial?
SECTION- B

Attempt the following

Q.3) Explain Biot-Savart Law

Q.4) A rectangular coil of a wire of 50 turns, each of area 8 cm², is suspended freely in radial magnetic field of induction 2x10⁻² Wb/m². When a current of 5 mA is passed through the coil, it deflects through 60°. Find the torsional constant of the suspension fibre.

Q.5) A current of 5 A is flowing from south to north in a wire kept along north-south direction. Find the magnetic field due to 1 cm piece of a wire at a point 2m north east from the piece of wire.

Q.6) Write a note on magnetic potential energy of a dipole.

SECTION-C

Attempt the following

Q.7) Explain construction and working of moving coil galvanometer.

Q.8) A rectangular coil of dimensions 4cm x 10cm consists of 50 turns of wire and carries a current of 25 mA.
(i) Calculate the magnitude of its magnetic moment.
(ii) If a uniform magnetic field of magnitude 0.35 T is applied parallel to the plane of the coil, what is the magnitude of the torque acting on the coil?

SECTION- D

Attempt the following

Q.9) Derive an expression for torque acting on a plane coil in a uniform magnetic field.