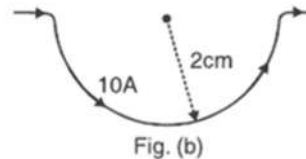
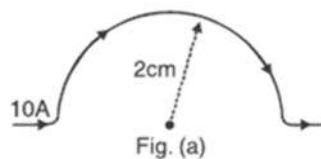


1. A cyclotron is not suitable to accelerate electron. Why? [1]
2. Why the core of moving coil galvanometers is made of soft iron? [1]
3. If the current is increased by 1% in a moving coil galvanometer. What will be percentage increase in deflection? [1]
4. Write S.I. unit of (i) Pole strength and (ii) Magnetic dipole moment. [1]
5. What is the direction of magnetic dipole moment? [1]
6. A current of 10A flows through a semicircular wire of radius 2cm as shown in figure (a). What is direction and magnetic field at the center of semicircle? Would your answer change if the wire were bent as shown in figure (b)? [2]



7. A magnetic dipole of magnetic moment M is kept in an magnetic field B . What is the minimum and maximum potential energy? Also give the most stable position and most unstable position of magnetic dipole. [2]
8. Mention two properties of soft iron due to which it is preferred for making electromagnet. [2]
9. A circular coil of n turns and radius R carries a current I . It is unwound and rewound to make another coil of radius of radius $R/2$, current remaining the same. Calculate the ratio of the magnetic moment of the new coil and original coil. [2]
10. Define the term magnetic dipole moment of a current loop. Write the expression for the magnetic moment when an electron revolves at a speed ' v ', around an orbit of radius ' r ' in hydrogen atom. [2]
11. Derive an expression for the force acting on a current carrying conductor placed in a uniform magnetic field Name the rule which gives the direction of the force. Write the condition for which this force will have (1) maximum (2) minimum value? [3]
12. State Biot- Savarts law. Derive an expression for magnetic field at the centre of a circular coil of n -turns carrying current – I ? [3]

13. What is radial magnetic field? How it is obtained in moving coil galvanometer? [3]
14. A long straight wire carries a current of 35 A. What is the magnitude of the field B at a point 20 cm from the wire? [3]
15. A horizontal overhead power line carries a current of 90 A in east to west direction. What is the magnitude and direction of the magnetic field due to the current 1.5 m below the line? [4]
16. (a) What is cyclotron? Explain its working principle? [4]
- (b) A cyclotron's oscillator frequency is 10MHz what should be the operating magnetic field for accelerating protons? If radius of its dees is 20cm, what is the K.E. of the proton beam produced by the accelerator? ($e = 1.6 \times 10^{-19} \text{ C}$, $m_p = 1.6 \times 10^{-27} \text{ kg}$, $1 \text{ MeV} = 1.602 \times 10^{-13} \text{ J}$)?
17. Draw a labelled diagram of a moving coil galvanometer. Prove that in a radial magnetic field, the deflection of the coil is directly proportional to the current flowing in the coil. [5]