1. Q amount of charge is uniformly distributed over some body. How should the body be divided into two parts, so that the force acting between the two parts is maximum for a given separation between them?
2. A drop of water (spherically shaped) has 3 x 10-10 C amount of charge residing on it. 500 V electric potential exists on its surface. Calculate the radius of this drop. Two such drops (having identical charge and radius) combine to form a new drop. Calculate the electric potential on the surface of the new drop. K = 9 x 109 SI.
3. A battery having an emf £ and an internal resistance r is connected with a resistance R. Prove that the power in the external resistance is maximum when R=r.
4. Two long solenoids are of equal length l and the smaller solenoid having cross-sectional area a is placed within the larger solenoid in such a way that their axes coincide. Find the mutual inductance of the system.
5. Height of TV tower is 102 m. If the average population density is 1000 / km2 , how many people can observe the programmes of this station? (Radius of the Earth = 6400 km)
6. Write limitations of Bohr model.
7. Write four characteristics of Photon
8. Write Kirchhoff's First Law and obtain equation using necessary figure.
9. Write down points of comparison between an electric dipole and a magnetic dipole
10. A 900 pF capacitor is charged with the help of 100 V battery. Calculate the steady electric energy on this capacitor. The above capacitor is disconnected from the battery and is connected to another identical capacitor. What will be the total energy of the system?

11. When a linear object is placed in front of a convex mirror, image of the $\frac{1}{4}$ th size of the object is formed. Calculate the object distance and the image distance. This linear object is kept perpendicular to the axis.
12. A 900 pF capacitor is charged with the help of 100 V battery. Calculate the steady electric energy on this capacitor. The above capacitor is disconnected from the battery and is connected to another identical capacitor. What will be the total energy of the system?
13. Write the equation of magnetic force acting on a particle moving through a magnetic field. Using it, obtain Newton's equation of motion and show that Kinetic Energy of the particle remains constant with time.
14. 3% of the total energy of a 100 W bulb is converted into visible light. Calculate the average intensity at a spherical surface which is at a distance of 1 m from the bulb. Consider the bulb to be a point source and let the medium be isotropic.
15. Depth of a well is 5.5 m and it is completely filled with water. The refractive index of water is 1.33. If viewed from the top, by how much height would the bottom of the well appear to be shifted up.
16. A circular coil having N turns is made from a wire of L meter length. If a current of I amp. is passed through the coil, which is suspended in a uniform magnetic field ofB Tesla, find the maximum torque that can act on the coil.
17. Two long solenoids are of equal length l and the smaller solenoid having a cross sectional area a is placed within the larger solenoid in such a way that their axes coincide. Find the mutual inductance of the system.
18. Explain Analogy and Digital communication

19. 10% of the total energy of a 100 W bulb is converted into visible light. Calculate the average intensity at a spherical surface which is at a distance of 2 m. from the bulb. Consider the bulb to be a point source and let the medium be isotropic.
20. Define the power of a Lens.