PHYSICS

BOOKS - IE IRODOV PHYSICS (HINGLISH)

ELECTRICITY AND MAGNETISM

Others

1. Find the electric field potentail and strength at the centre of a hemisphere fo raidus R

ahcged uniformly with the the surface density σ.

Watch Video Solution

2. A winch is driven by an electric motor with a separate excitation and fed from a battery of emf $E = 300V$. The rope and the hook of the winch rise at a velocity $v_1 = 4m/s$ without a load and at a velocity $v_2 = 1m/s$ with a load of mass $m = 10kg$.

Determine the velocity v' of the load and its mass m' for which the winch has the maximum power, neglecting the mass of the rope and the hook.

Watch Video Solution

3. A capacitor of unknown capacitance, a coil of inductance L, and a resistor of re-

sistance R are connected to a source of a.c. voltage $E = e_0 \cos \omega t$ (Fig. 112). The current in

the circuit is $I = (E_0 / R)\cos \omega t$.

Determine the amplitude U0 of the voltage across the capacitor plates.

Watch Video Solution

4. Under the action of a constant voltage U, a capacitor of capacitance $C = 10^{-11} F$

included in the circuit shown in Fig. 113 is charged to $q_1 = 10^{-9} C$. The inductance of the coil, is $L = 10^{-5} H$, and the resistance of

the resistor is $R = 100\Omega$.

Determine the amplitude q_0 of steadystate oscillations of the charge on the capacitor at resonance if the amplitude of the external sinusoidal voltage is $U_0 = U$.

Watch Video Solution

5. A bank of two series-connected capacitors of capacitance C each is charged to a voltage U and is connected to a coil of inductance L so that an oscillatory circuit (Fig. 114) is formed at

the initial moment. After a time τ, a breakdown occurs in one of the capacitors, and the resistance between its plates becomes zero.

Determine the amplitude q_0 of charge oscillations on the undamaged capacitor.

Watch Video Solution

6. How can the damage due to overheating the coil of a superconducting solenoid be avoided?

Watch Video Solution