Sharjah Indian School – Boys Wing

HOT Skills Test in **Physics -**2012 Class:XII Time:1 hour 15 min – 30 marks

1. A current is passed through a steel wire heated to red. Then half of the wire is immersed in cold water. Which half of the wire will heat up more and why? 1
2. Resonant frequency of LCR circuit is 100Hz. What will be the nature of the circuit at 10Hz? 1
3. Plot a graph showing the variation of radius of orbit to the principal quantum number? 1
4. The electric potential V(x) in a region along the X-axis varies according to the relation V(x) = 4x2. Calculate the force experienced by 1µC charge placed at x = 1m. 2
5. An object is placed in front of a concave lens at a distance equal to the focal length of the lens. Calculate the magnification of the image. 2
6. The maximum K.E of photoelectrons is ‘E’ if the wavelength of incident light is λ/2. If the energy becomes double when the wavelength is reduced to λ/3, find the work function of the metal. 2
7. An LCR series circuit with R = 100 Ω is connected to a 200V, 50Hz ac source. When only the capacitance is removed the current lags the voltage by 60o. When only the inductor is removed, the current leads voltage by 60o. Find the current in the circuit. 2
8. The electric field between the plates of a parallel plate capacitor is changed at the rate of

 2x106V/ms. The area of each plate is 10cm2. Find the displacement current between the

 plates. 2

1. A beam of electrons is accelerated under p.d V1. This beam experiences a force ‘F’ in a uniform magnetic field. The accelerating potential is increased to V2 so that force becomes 2F. Find the ratio V1/V2. 2
2. An object and a screen are set up 80 cm apart. There are two positions at which a convex lens forms a real image on the screen, the magnifications in the two cases being 2/3 and 3/2. Find the focal length of the lens. 3
3. A 50Hz AC of peak value 2A flows through the primary coil of a transformer if the mutual inductance between the primary and the secondary is 0.5H. Find the peak value of induced voltage in the secondary. 3
4. All the seven arms of the electrical network shown beside

 have equal lengths and equal resistance.

 Show that if a current I, enters the network at point A,

 and leaves at point F, the current in the arm CD is I / 5.

 3

1. Power from a 64 V dc source goes to charge a battery of 8 lead accumulators each of emf 2 V and internal resistance 1/8 Ω. The charging current also runs a motor placed in series with the battery. If the resistance of the windings of the motor is 7 Ω and the supply current is 3.5 A, obtain

 The mechanical energy yielded by the motor in 1 hour and

 The chemical energy stored in the battery during charging in 1 hour. 3

1. Two long straight wires carry currents 12 A and 8 A in the same direction. If the wires are 10 cm apart in air, find where a third wire, also carrying a current, must be placed so that it experiences no net force. 3