## GUESS PAPER-2013

CLASS-XII

Physics

**Unit Test -I ( 2013)**

**Time:- 1 Hour M.M. = 25**

Question :- 1 The electric potential V is constant in a given region. What is the value of electric field there? 1

Question:- 2 How does the presence of dielectric medium, in between the two charges, affect the electrostatic

 force between them? 1

Question:- 3 Two electric charges 2 µC and 4 µC are separated by a distance of 18 cm. Calculate the electric

 potential at the centre of the line joining the two charges. 2

Question:- 4 Define electric resistance .Write it’s SI unit. How does resistance of a conductor vary if

1. Conductor is stretched to 4 times of it’s length?
2. Temperature of conductor is increased?
3. You are given two wire of same length and thickness, one is of copper and other is

of silver, which one has higher resistance? 2

Question:- 5 Explain quantization of charge. Calculate the charge on a 8O16 nucleus. 2

Question:- 6 a) Compute the resultant resistance in the given diagram where each resistance is of 12 Ω .

 b) Define electric power. Write it’s SI unit. An electric aplliance draws an electric current of

 6 A from a 220 V source. Calculate power of electric appliance. 3

Question:- 7 Derive an expression for torque experienced by an electric dipole, when placed in a uniform

 electric field.

 An electric dipoleof length 2 cm is placed with its axis making an angle of of 600 to a uniform

 electric field of 105  NC-1 . If it experiences a torque of 8$√3$ N-m, calculate the magnitude of charge

 on dipole. 3

Question:- 8 Derive an expression for energy stored in a capacitor. Prove that energy density of a capacitor is

 Given by u = ½ ε0 E2 . 3

Question:- 9 Define linear charge density. Write its SI unit. An infinite line charge produces a field of 9 X 104 N/C

 at a distance of 2 cm . Calculate linear charge density. 3

Question:- 10 Derive an expression for capacitance of a parallel plate capacitor, with plate area ‘A’ and ‘d’ as the

 separation between the plates. Two dielectric slabs of K1  and K2 are filled in between the plates of

 capacitor as shown in figure. Calculate new capacitance.

 K1 K2

 d/2 d/2

 I I I

 OR

 Define electric flux. A uniform electric field is given as $\vec{E}$ = 200$\hat{i}$ N/C for ( positive x ) and

 $\vec{E}$ = - 200$\hat{i}$ N/C for ( negative x ). A right circular cylinder of radius length 20 cm and radius 7 cm

 is placed symmetrically at origin along X-axis.

1. What is the outward flux through each flat surface?
2. What is the flux through the curved surface of cylinder?
3. What is the net outward flux through cylinder?
4. What is net charge inside the cylinder?