Physics

Reg.No. :

I.Answer all the Questions.

II.Use blue pen only.

Time : 02:00:00 Hrs

Total Marks : 71

Section-A

5 x 1 = 5

1) when the glass rod is rubbed with silk,the silk acquires.......glass rod acquires.........

    (a) positive charge;negative charge   (b) negative charge,depreciation   (c) positive charge,polishness   (d) negative charge, positive charge;

2) when a rod is charged by rubbing

    (a) charges are produced in it   (b) charges are distributed in it   (c) both a and b are correct   (d) a is wrong b is correct..

3) the value of ε_0

    (a) $8.854 \times 10^{12} Nm^2 C^2$ (b) $8.854 \times 10^{-12} Nm^2 C^{-1}$ (c) $8.854 \times 10^{-12} C^2 N^{-1} m^{-2}$ (d) $8.854 \times 10^{-12} Nm^2 C^{-2}$

4) when is the relative permitivity of a medium which of the following is correct?

    (a) $E_r = E/E_0$ (b) $E_r = F/F_m$ (c) $E > 1$ (d) all these

5) In a hydrogen atom the elctron and the proton are proton are bound together at a seperation of about 0.53A.if the potential energy is zero at infinitie seperation,then the potential energy of the electran proton system is

    (a) -54.4eV   (b) -27.2eV   (c) -13.6eV   (d) zero

Section-B

7 x 3 = 21

6) State the use of Van de Graff generator.

7) State any three properties of electric lines of force?

8) Define 'Coulomb' on the basis of coulomb's law.

9) State Gauss law in electrostatics.

10) Define electrostatics.

11) Define relative permittivity?

12) What is called electric field intensity?

Section-C

3 x 5 = 15

13) The area of each plate of a parallel plate capacitor is $4 \times 10^{-2} sq\ m$. If the thickness of the dielectric medium between the plates is $10^{-3} m$ and the relative permittivity of the dielectric is 7. Find the capacitance of the capacitor.

14) Two capacitors of unknown capcitances are connected in series and parallel. If the net capacitances in the two combinations are $6\mu F$ and $25\mu F$ respectively, find their capacitances.

15) Two capacitances $0.5\mu F$ and $0.75\mu F$ are connected in parallel and the combination to a 110 V battery. Calculate the charge from the source and charge on each capacitor.

Section-D

3 x 10 = 30

16) State Gauss's law, Applying this, calculate the electric field due to uniformly charged spherical shell.

17) Derive an expression for electric field due to an electric dipole at a point on the equatorial line.

18) a)

    Three capacitors are connected in parallel to a 100 V battery as shown in figure. What is the total energy stored in the combination of capacitor?
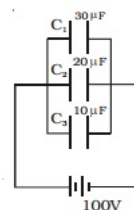
    b)   A parallel plate capacitor is maintained at some potential difference. A 3 mm thick slab is introduced between the plates. To maintain the plates at the same potential difference, the distance between the plates is increased by 2.4 mm. Find the dielectric constant of the slab.

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