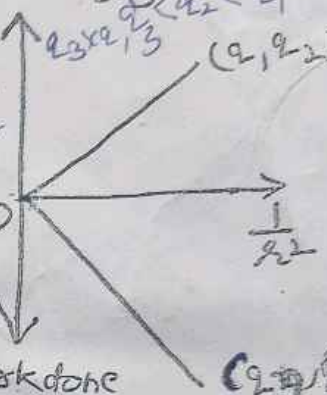
L-M-30. CLASS-12 Subject - Physics Time: 1Hr.

SECTION-A (1X5=5)

21. Two identical small conducting balls B_1 and B_2 are given $-7\,pc$ and $+4\,pc$ charges respectively. They are brought in contact with a third identical balls B_3 and then separated. If the final charge on each ball is $-2\,pc$ the initial charge on B_3 was (a) $-2\,pc$ (b) $-3\,pc$ (c) $-5\,pc$ (d) $-15\,pc$

22. The Coulomb force(F) verse $\left(\frac{1}{r^2}\right)$ graphs for two pairs of pt charges (q_1 and q_2) and (q_2 and q_3) are shown in figure. The charge q_2 is positive and least magnitude. Then



(a) $q_1 > q_2 > q_3$ (b) $q_1 > q_3 > q_2$ (c) $q_3 > q_2 > q_1$

(d) $q_3 > q_1 > q_2$

23. There is an electric field E in X-direction. If the work done in moving a charge of 0.2 C through a distance of 2m along a line making an angle of 60° with x-axis is 4 J, the value of E is

(a) $2\sqrt{3}$ N/C (b) 5 N/C (c) 4 N/C (d) 20 N/C

24. If $\vec{E} = \hat{i} + \sqrt{2}\hat{j} + \sqrt{3}\hat{k}$, then electric flux through a surface of area $100\,m^2$ lying in xy plane is (in Vm)

(a) 100 (b) 141.4 (c) 173.2 (d) 200

25. Charge on a body which carries 200 excess electron is

(a) -3.2×10^{-18} C (b) 3.2×10^{-18} C (c) -3.2×10^{-17} C (d) 3.2×10^{-17} C

SECTION-B 2X4=8 1X5=5

26. Deduce Newton's III law. Using coloumb's law, -5.12×10^{-17}

27. What do you mean by equipotential surface. Draw the equipotential surface due to a dipole.

28. Derive an expression for the potential energy due to dipole placed in the uniform electric field. Also show that $U = -\vec{p} \cdot \vec{E}$

. A cube of side 0.1 m is placed, As shown in diagram, in a region