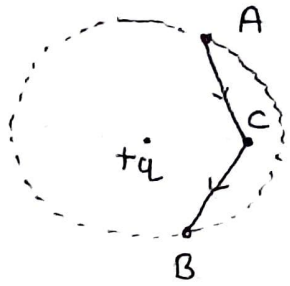
G.N. National Public School
Physics Assignment-5
Topic - Electric Potential

Q.1:- A metal wire is bent into a circle of radius 10cm. It is given a charge of 200μC which spreads on it uniformly. Calculate the electric potential at its centre?

Q.2:- ABCD is a square of side 0.2 m. charges of 2×10^{-9}, 4×10^{-9}, 8×10^{-9} coulomb are placed at the corners A, B and C respectively. Calculate the work required to transfer a charge of 2×10^{-9} coulomb from corner D to the centre of square?

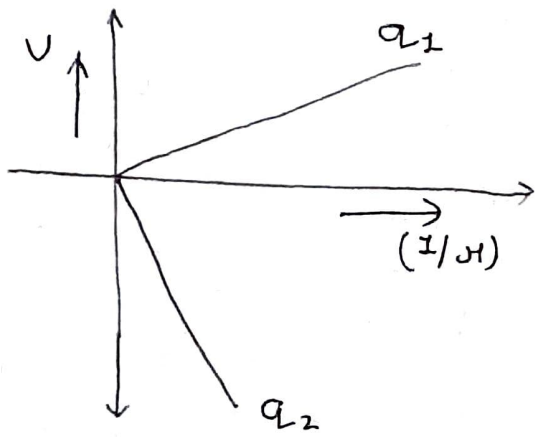
Q.3:- If a point charge +q is taken first from A to C and then from C to B of a circle drawn with another point charge +q as centre, then along which path more work will be done?

Q:-4:- In fig. the two graphs show the variation of electrostatic potential (V) with 1/r (r being distance of the field point from the point charge) for two charges q_1 and q_2-



(i) what are the signs of the two charges?

(ii) which of the two charges has a larger magnitude & why?



Q:-5:- In the electric field - $\vec{E} = 3x\hat{i} - 2y\hat{j} + 5z\hat{k}$ find the Potential difference between the points A (1,3,5) and B (3,2,7)?

Q.6:- The electric potential at a point is given by

$$V = 3x^2y + 5y^2z + 7z^2x$$

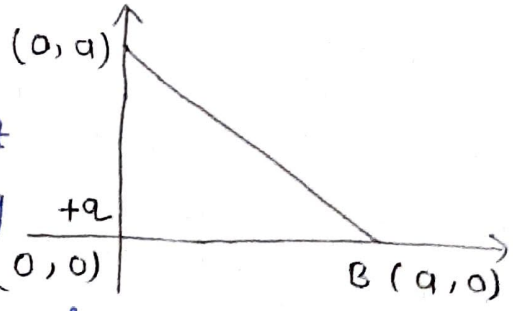
find the magnitude of electric field at the point (3, 2, 1) ?

Q.7:- what is the potential gradient at a distance of 10^{-12} m from the centre of the platinum nucleus? what is the potential gradient at the surface of the nucleus ? ($Z = 78$, Radius $= 5 \times 10^{-15}$ m) ?

Q:-8:- A cube of side b has a charge q at each of its eight vertices. Determine the potential and electric field due to this charge array at the centre of the cube ?

Q:-9:- Calculate the potential on the axis of a ring due to a charge Q uniformly distributed along the ring of Radius R ?

Q:-10:- A point charge $+q$ is placed at the origin O as shown in the figure. work done in taking another point charge $-Q$ from the point A (0, a) to another point B (a, 0) along the straight path AB is :-



Q:-11:- Two charges 5×10^{-8} C and -3×10^{-8} C are located 16 cm apart. At what point on the line joining the two charges is the electrical potential zero? Take the potential at infinity to be zero.

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