PHYSICS 12

Electric Potential Energy, Electric Potential and Voltage – practice

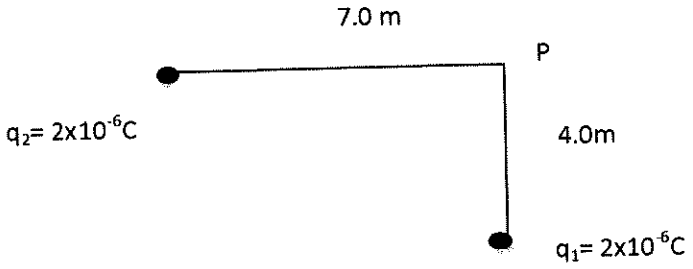
1. Point P is located 5 cm from a positive charge $q_1 = 6x10^{-10}C$ and 9 cm from a negative charge $q_2 = -9x10^{-10}C$. What is the total potential at point P? **(18V)**

2. How much work is required to bring a charge of $5.0x10^{-9}C$ from an infinite distance up to a distance of 2 cm from an isolated point charge of $8.0x10^{-8}C$? **($1.8x10^{-4}J$)**

3. The potential difference between two parallel plates is 800 V and the plates are separated by 0.5cm. Find the magnitude of the electric field between the two plates. **($1.6x10^{5}N/C$)**

4. A moving proton has 6.4×10^{-16}J of kinetic energy. The proton enters a region between two parallel plates and it is accelerated by a potential difference of 5000 V between the two parallel plates. Find the speed at which the proton emerges from the region between the two parallel plates. **(1.3×10^{6}m/s)**

5. What is the electric potential at point P due to the two point charges? **(7.07×10^{3}V)**



6. Determine the kinetic energy of a proton accelerated by a potential difference of 25000V.**(4.0×10^{-15}J)**

7. An alpha particle moves from rest in an electric field of 2000V/m.

a) Determine the force exerted on the alpha particle by the electric field. **(6.4×10^{-16}N)**

b) Determine the kinetic energy of the alpha particle after it moves 5 cm in this electric field. **(3.2×10^{-17}J)**

8. Given that the work required to move a charge through a potential difference of 5.0×10^{8}V is 1.6×10^{-10}J, determine the magnitude of the charge. **(3.2×10^{-19}C)**

9. In a typical cathode-ray tube, electrons are accelerated through a potential difference of 3.0×10^{4} V. Given that the mass of an electron is 9.11×10^{-31}kg, determine the speed of the electron. **(1.02×10^{8}m/s)**

10. Starting from rest, a proton drifts through a potential difference of 10^5V. Determine the final kinetic energy and final speed of the proton. **(1.6×10^{-14}J, 4.38×10^6m/s)**

11. Find the electric potential at point A as a result of the distribution of three point charges at the base of the triangle. Where $q_1 = q_2 = q_3 = 1.6\times10^{-19}$C and q_2 is placed at the midpoint of the base. **(2.3×10^{-8}V)**