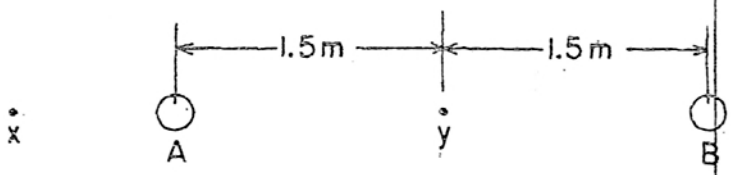
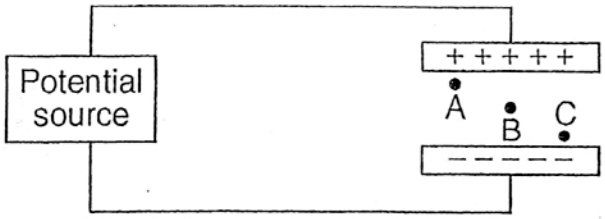
29. Base your answer to the following question on the diagram below which represents two small charged spheres, *A* and *B*, 3 meters apart. Each sphere has a charge of $+2.0 \times 10^{-6}$ *C*.



If sphere *A* is moved toward sphere *B*, the electric field intensity at point *x* will

(1) decrease
(2) increase
(3) remain the same

30. The diagram below represents a source of potential difference connected to two large, parallel metal plates separated by a distance of 4.0×10^{-3} meter.



Which statement best describes the electric field strength between the plates?

(1) It is zero at point *B*.
(2) It is a maximum at point *B*.
(3) It is a maximum at point *C*.
(4) It is the same at points *A*, *B*, and *C*.

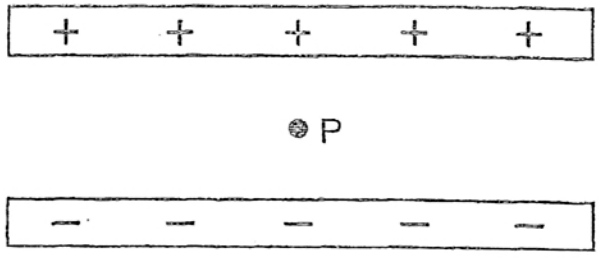
31. What is the magnitude of the electrostatic force acting on an electron located in an electric field having a strength of 5.0×10^{3} newtons per coulomb?

(1) 3.1×10^{22} N
(2) 5.0×10^{3} N
(3) 8.0×10^{-16} N
(4) 3.2×10^{-23} N

32. How much work is required to move a single electron through a potential difference of 100. volts?

(1) 1.6×10^{-21} J
(2) 1.6×10^{-19} J
(3) 1.6×10^{-17} J
(4) 1.0×10^{2} J

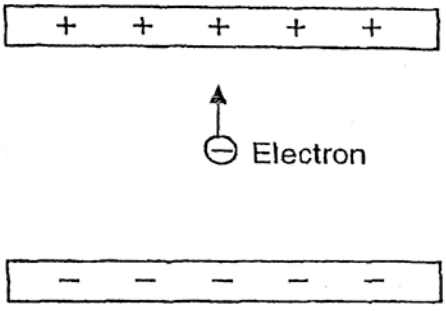
33. The diagram below shows a point, *P*, located midway between two oppositely charged parallel plates.



If an electron is introduced at point *P*, the electron will

(1) travel at constant speed toward the positively charged plate
(2) travel at constant speed toward the negatively charged plate
(3) accelerate toward the positively charged plate
(4) accelerate toward the negatively charged plate

34. An electron is placed between two oppositely charged parallel plates as shown in the diagram below.



As the electron mover toward the positive plate, the magnitude of the electric force acting on the electron

(1) decreases
(2) increases
(3) remains the same

35. At point *P* in an electric field, the magnitude of the electrostatic force on a proton is 4.0×10^{-10} newton. What is the magnitude of the electric field intensity at point *P*?

(1) 6.4×10^{-29} N/C
(2) 1.6×10^{-19} N/C
(3) 4.0×10^{-10} N/C
(4) 2.5×10^{9} N/C