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| **± A Proton between Oppositely Charged Plates** |
| A uniform electric field exists in the region between two oppositely charged parallel plates 1.53 cm apart. A proton is released from rest at the surface of the positively charged plate and strikes the surface of the opposite plate in a time interval 1.47×10−6 s.   |  |  | | --- | --- | | Part A |  | | Find the magnitude of the electric field.   |  |  | | --- | --- | | Hint A.1 | **How to approach the problem** | | ***Hint not displayed*** | | | Hint A.2 | **A relationship between electric force and electric field** | | ***Hint not displayed*** | |  |  |  | | --- | --- | | Hint A.3 | **Calculate the acceleration of the proton** | | ***Hint not displayed*** | | | Hint A.4 | **Calculate the force on the proton** | | ***Hint not displayed*** | |   **Use 1.60×10−19 C for the magnitude of the charge on an electron and 1.67×10−27 kg for the mass of a proton.**   |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | | ANSWER: | |  |  |  |  |  | | --- | --- | --- | --- | --- | |  |  | ***Answer not displayed*** | \rm{N/C} |  | | | | | Part B |  | | Find the speed of the proton at the moment it strikes the negatively charged plate.   |  |  |  | | --- | --- | --- | | Hint B.1 | **How to approach the problem** | | | ***Hint not displayed*** | | | | ANSWER: | | |  |  |  |  |  | | --- | --- | --- | --- | --- | |  |  | ***Answer not displayed*** | \rm{m/s} |  | | | | |