Physics 235 Winter 2013: Exam #1
Form #1

Please print your name:_____

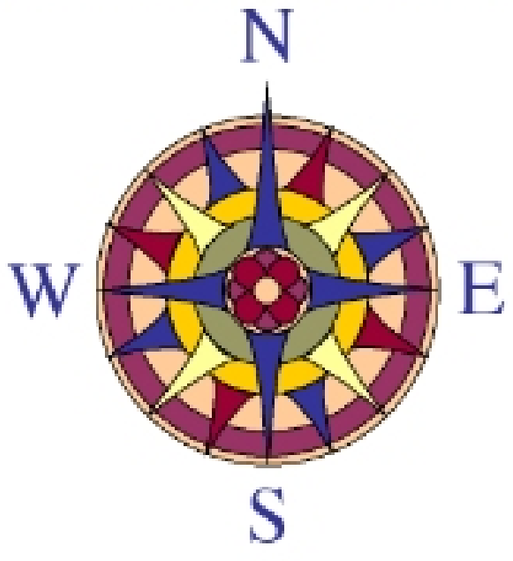
Instructions

1. Fill in your name above
2. Fill in your name, ID number, and **form number** on your scantron sheet
3. This will be a 1 hour 50 minute, closed book exam.
4. You may use a calculator, please do not share calculators.
5. The exam includes 20 multiple choice questions which will be machine graded. Each question is worth 5 points. No partial credit will be given.
6. For this exam, you can bring *one* 3x5" card with any notes you wish to have. You will also find all the physical constants that you might require listed below.

Constants you might need:

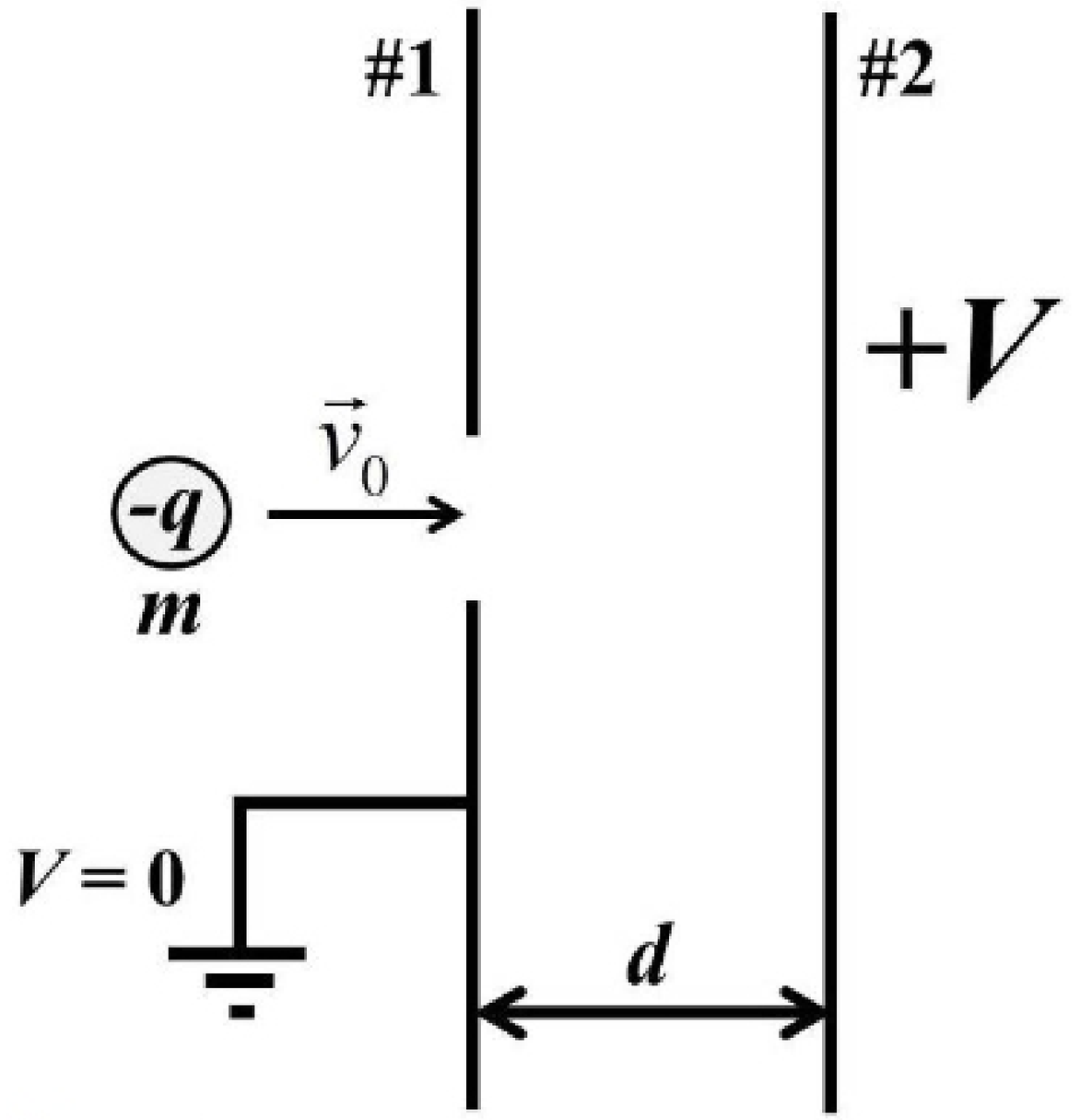
$k = 8.99 \times 10^{9}\ Nm^2/C^2$
$\varepsilon_0 = 8.85 \times 10^{-12}\ C^2/Nm^2$
$g = 9.8\ m/s^2$
$\mu_0 = 4\pi \times 10^{-7}\ Tm/A$
Mass of the electron: 9.11×10^{-31} kg
Magnitude of the electron charge: 1.6×10^{-19} C
Mass of the proton: 1.67×10^{-27} kg
Atomic Mass Unit (1 amu): 1.66×10^{-27} kg
1 Gauss = 10^{-4} T
Speed of sound in air = 340 m/s
Threshold of hearing $I_0 = 10^{-12}\ W/m^2$
Speed of light in vacuum = 3.0×10^{8} m/s
$k_B = 1.38 \times 10^{-23}\ m^2kg/s^2K = 1.38 \times 10^{-23}$ J/K
Astronomical Unit (1AU) = 1.5×10^{11} m

1. In a certain region of space the electric potential V increases proportional to distance as you head due ***south*** and does not vary in any other direction. The electric field:



A) points north and varies with position
B) points north and does not vary with position
C) points south and varies with position
D) points south and does not vary with position
E) points east and does not vary with position

2. A particle with mass m and, charge $-q$ is projected with velocity $\vec{v}_0$ through a small hole into the region between two large parallel plates as shown. Plate #1 is held at a potential of zero while plate #2 is held at a potential of $+V$. The plates are separated by a distance d. You may neglect any effects due to the hole in plate #1. The *change* in the particle's kinetic energy as it travels from plate #1 to plate #2 is:



A) $-qV/d$
B) $2qV/mv_0^2$
C) qV
D) $\frac{1}{2}mv_0^2$
E) None of the other answers are correct.