United International University

School of Science and Engineering

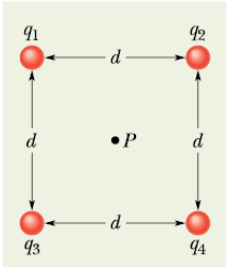
Quiz#04; Year 2020; Semester: Fall
Course: PHY 105; Title: Physics
Full Marks: 20; Section: A; Time: 20 minutes

Name:	ID:	Date:

1. What is electric potential energy? Write down the relation between the change in electric potential and change in electric potential energy. **1**

2. Draw a convenient graph for electric dipole moment with direction. **0.5**

3. What is the electric potential at point *P*, located at the centre of the square of point charges shown in figure below? The distance *d* is 230 cm, and the charges are q_1=12mC, q_2=-24mC, q_3=310mC, and q_4=170mC. **2.5**



4. A Sodium (mass *23g*, charge +11*e*) and an alpha particle (mass 4g, charge +2*e*) approach one another with the same initial speed $v=10^6$ m/s from an initially large distance. How close will these two particles get to one another before turning around? **[**Given, $k=8.99\times10^9$ Nm^2C^{-2} and $q_e= 1.6\times10^{-19}$ Coulomb**]** **2**

5. Fair weather atmospheric electricity = 100 N/C is acting downward 100 km high in the ionosphere. What is the ionosphere voltage required? **2**

6. An electron is projected perpendicularly to a upward electric field of **E= 1020 N/C** with a horizontal velocity **$v=10^6$ m/s.** If the electron is vertically deflected 2.6 cm due to electric field, how much is the distance travelled by the electron inside the electric field? Draw an appropriate figure, if necessary. Given, $m_e=9.31\times10^{-31}$ kg and $q_e= -1.6\times10^{-19}$ Coulomb. **2**