KFUPM Physics Department	Phys102-242 Sec:04-05-06	Quiz-0306 06-Mar-2025

NAME _____

STUDENT No. _____

SECTION No. _____

STUDENT NUMBER

SECTION NUMBER

TEST CODE No.

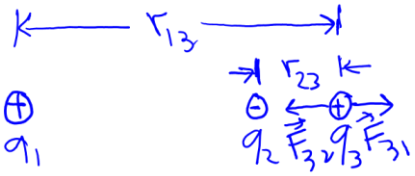
1 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	26 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	51 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	76 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	101 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ
2 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	27 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	52 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	77 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	102 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ
3 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	28 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	53 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	78 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	103 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ

Q1. A charge of + 3.57 μC is placed at the origin. A second charge q_2 is placed at x = 3.00 m. If a charge of 1.00 μC experiences no force if placed at x = 4.00 m, then the charge of q_2 in μC is:

A) -0.397
B) 0.223
C) -0.223
D) 0.397
E) -2.01

$F_{31} = F_{32}$

$k\frac{|q_1||q_3|}{r_{13}^2} = k\frac{|q_2||q_3|}{r_{23}^2}$



$|q_2| = |q_1|\frac{r_{23}^2}{r_{13}^2} = 3.57\times10^{-6}\frac{1^2}{4^2} = 0.223\ \mu C$

$q_2 = -0.223\ \mu C$

Q2. How much work in the units of 10^{-24} J is required to turn an electric dipole 180° in a uniform electric field of magnitude 39.7 N/C if the dipole moment has a magnitude of 3.02×10^{-25} C m and the initial angle between the electric field and the dipole moment is 64.0°?

A) -1.33
B) 10.5
C) -10.5
D) 1.33
E) 21.6

$W_a = +\Delta U = U_f - U_i$

$= (-pE\cos\theta_f) - (-pE\cos\theta_i)$

$= pE(\cos\theta_i - \cos\theta_f)$

$= 3.02\times10^{-25}(39.7)(\cos 64^\circ - \cos(64^\circ+180^\circ))$

$= 10.5\times10^{-24}$ J

23 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	48 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	73 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	98 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	123 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ
24 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	49 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	74 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	99 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	124 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ
25 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	50 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	75 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	100 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	125 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ