NAME _____

STUDENT No. _____

SECTION No. _____

STUDENT NUMBER

SECTION NUMBER

TEST CODE No.

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1 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ   26 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ   51 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ   76 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ   101 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ

2 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ   27 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ   52 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ   77 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ   102 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ

3 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ   28 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ   53 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ   78 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ   103 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ

Q1. When a piece of paper is held with its face perpendicular to a uniform electric field the flux through it is 89.7 N·m²/C. When the paper's face is 26.3° with respect to the field, the flux through it in the unit N·m²/C is:

A) 35.2
B) 80.4
C) 58.0
D) 39.7
E) 58.7

$\vec{A}$ $\vec{E}$ $\phi = EA \cos\theta = EA$

paper

$\vec{A}$

$26.3°$ $\vec{E}$ $\phi = EA\cos(90-26.3)$
paper $= 89.7 \cos(90-26.3) = 39.7 \frac{N\,m^2}{C}$
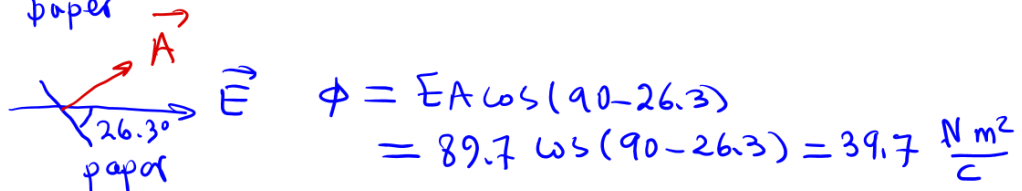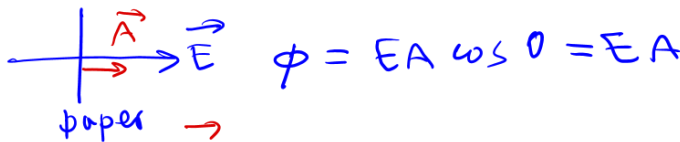
Q2. A solid sphere of radius 39.7 cm has a net charge uniformly distributed throughout its volume. If the magnitude of the electric field 11.4 cm from the center of the sphere is 145×10^6 N/C and points radially outward, what is the net charge of sphere in the unit mC?

A) 2.54
B) 8.85
C) 0.210
D) 0.0602
E) 2.11

$E = \frac{kq}{R^3} r \Rightarrow$

$q = \frac{ER^3}{kr} = \frac{(145\times10^6)(0.397)^3}{(8.99\times10^9)(0.114)} = 8.35\,mC$

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23 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ   48 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ   73 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ   98 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ   123 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ

24 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ   49 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ   74 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ   99 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ   124 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ

25 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ   50 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ   75 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ   100 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ   125 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ