Flag question

General Guidelines - READ CAREFULLY:

- Please make sure to upload your handwritten solution of **question 1,2,3,4,5 and 6** at the end of this assignment.
- Solve the questions, scan them, combine all questions in **one pdf file**, then upload them at the end of this assignment.

- Due date of **Assignment 2**: Wednesday, March, 31 - Midnight.
- Weight of **Assignment 2**: 10% of the total weight
- Late submission will be allowed with penalty (check Late submission instructions in your syllabus).

Value of some constants:

- $k = 9 \times 10^9 \frac{Nm^2}{C^2}$
- $\epsilon_0 = 8.85 \times 10^{-12} \frac{F}{m}$
- $1pC = 10^{-12}C; \quad 1nC = 10^{-9}C; \quad 1\mu C = 10^{-6}C$

General remarks:

- If you want to add scientific notation, as an example, 5×10^{-9}, use the following way: 5*10^-9

  Or use this tool

i 1 2 3
9 10 11 12
Finish attempt ...

Question 1

Not yet answered

Marked out of 5.00

Flag question

[5 points] Upload the handwritten solution of this question at the end of the assignment:

A constant electric field of magnitude 1.3×10^3 N/C is crossing a 10 cm^2 rectangular area and making an angle of 25° with its surface.

Calculate the electric flux passing through the rectangular area.

Φ = [ ] [$N.m^2/C$]

Quiz

Finish a

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Question **2**

Not yet answered

Marked out of 5.00

Flag question

[5 points] Upload the handwritten solution of this question at the end of the assignment:

A disk of radius R = 19 cm has a charge of Q = −4 μ C. Calculate the surface charge density of the disk in C/m^2.

σ = [C/m^2]

Quiz

i

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Question 3

Not yet answered

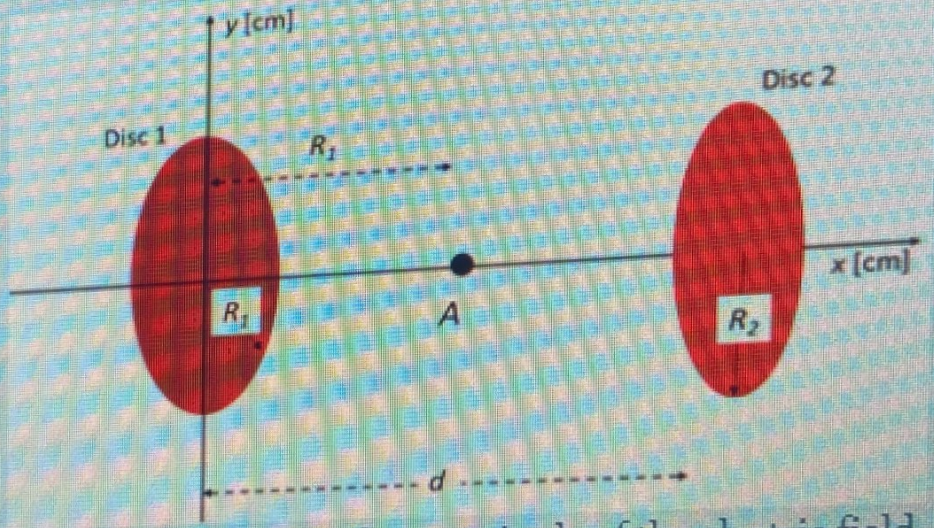
Marked out of 12.00

Flag question

[12 points] Upload ... this question at the end of the assignm...

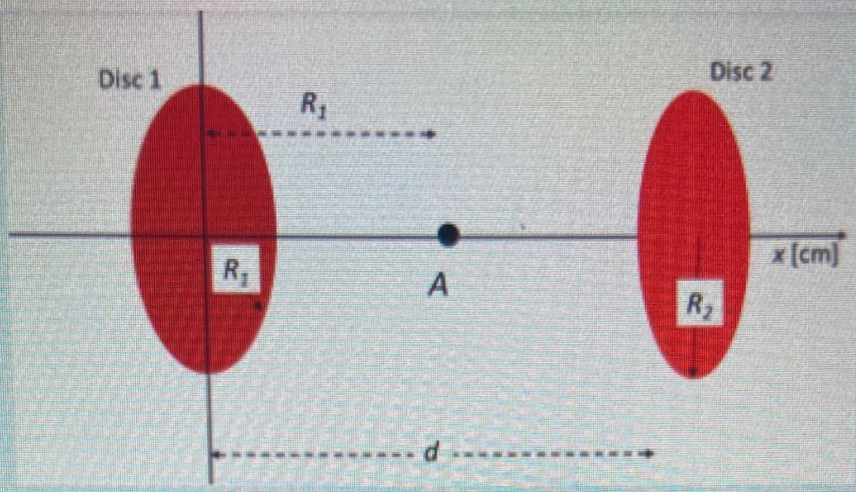
The figure shows two discs with their central axes along the x-axis.

- Disc 1 has a radius $R_1 = 8$ cm and a charge $Q_1 = -69$ pC uniformly distributed over the disc.
- Disc 2 has a radius $R_2 = 5$ cm and surface charge density $\sigma_2 = -27$ pC/m^2.
- The discs are separated by a distance d = 29 cm.



1. [4 points] Calculate the magnitude of the electric field created by the disc 1 at point A.

E_1 = [ ] [N/C]



1. [4 points] Calculate the magnitude of the electric field created by the disc 1 at point A.

$E_1 =$ [N/C]

2. [4 points] Calculate the total charge of disc 2 in Coulombs.

$Q_2 =$ [C]

3. [4 points] If the magnitude of the electric field created by disc 2 at point A is equal to 0.041 [N/C], find the electric field vector created by the disc 2 at point A.

$\vec{E}_2 =$ $\hat{i}$ + $\hat{j}$ [N/C]

Submit here - Assignment 2 (10%) due on Wednesday, March, 31 - Midnight

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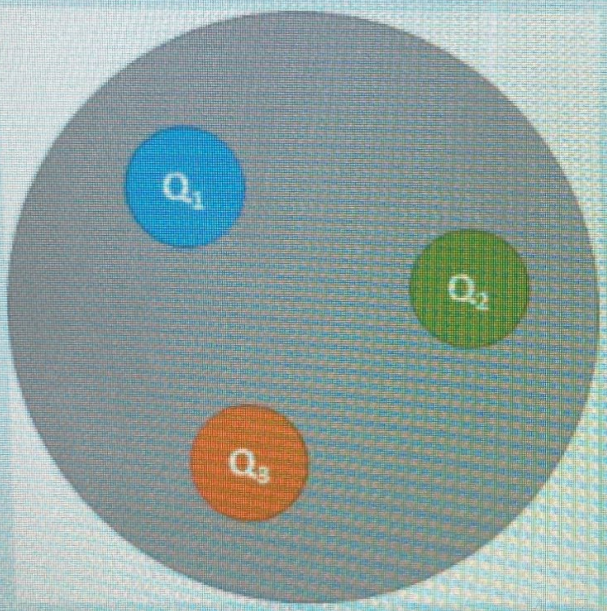
[10 points] Upload the handwritten solution of this question at the end of the assignment:

Consider three charges $Q_1 = -7$ [pC], $Q_2 = 7$ [pC] and $Q_3 = -1$ [pC].

1. [5 points] What is the total flux through the following spherical surface?



$\Phi =$ [N.m^2/C]

Quiz nav

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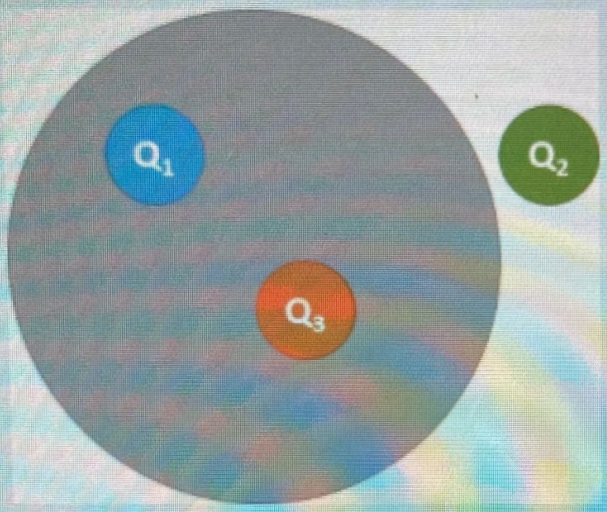
2. [5 points] What is the total flux through the following spherical surface?



Φ = [N.m²/C]

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Question 5

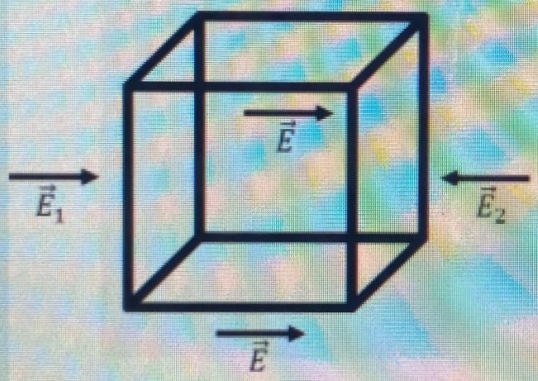
Not yet answered

Marked out of 20.00

Flag question

[20 points] Upload the handwritten solution of this question at the end of the assignment:

The electric field has been measured to be horizontal everywhere on the closed cube of side $d = 4$ [cm] as shown in the Figure. All over the left side of the box $E_1 = 424$ [N/C], and all over the right side of the box $E_2 = 142$ [N/C]. On the top, bottom, front and back sides the electric field is $E = 155$ [N/C].



1. [3 points] Which one of the following represents the formula for the electric flux?

- $\phi = EAcos(\theta)$
- $\phi = EAsin(\theta)$
- $\phi = Edcos(\theta)$

2. [2 points] What is the unit of the electric flux?

- ○ $N.m^2/C$
- ○ $N/C.m^2$
- ○ $N.m^2$
- ○ $N.C$

3. [5 points] What is the outward flux through the left side?

Select the correct answer from the list: $\Phi_{left}=$

4. [5 points] What is the outward flux through the right side?

Select the correct answer from the list: $\Phi_{right}=$

5. [5 points] What is the outward flux through the top, bottom, front and back sides?

Select the correct answer from the list: $\Phi_{top,bottom,front,back} =$

Question 6

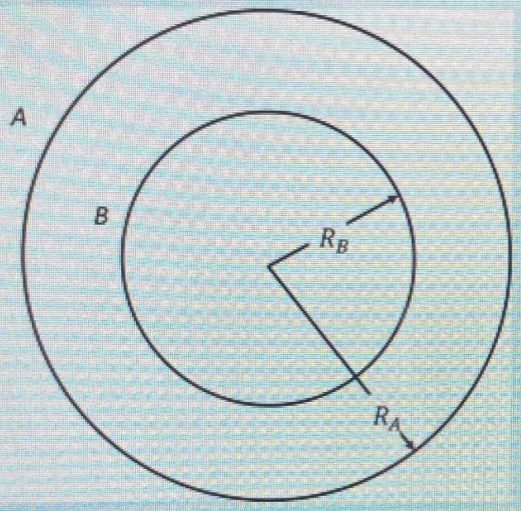
Not yet answered

Marked out of 23.00

Flag question

[23 points] Upload the handwritten solution of this question at the end of the assignment:

The figure shows two concentric thin spherical shells:



- Sphere-A of radius $R_A = 19$ cm and a total charge $Q_A = 3 \times 10^{-12}$ [C].
- Sphere-B of radius $R_B = 8$ cm and a total charge $Q_B = -2 \times 10^{-12}$ [C].

1. [3 points] Which one of the following represents the area of a sphere?

○ $4\pi r^3$ ○ $4\pi r^2$ ○ $\frac{4}{3}\pi r^3$

Quiz navigation

i 1 2 3
9 10 11 12

Finish attempt ...

2. [4 points] Which one of the following represents Gauss's Law?

○ $\Phi_{net} = \epsilon_0 / Q_{total}$ ○ $\Phi_{net} = Q_{total} / \epsilon_0$ ○ $\Phi_{net} = Q_{total}$

3. [4 points] What is the net electric flux through the spherical surface of radius r = 26 cm from the center of the spheres?

Select the correct answer from the list: Φ =

[ ] [N.m²/C]

4. [4 points] What is the magnitude of the electric field at r = 14 cm from the center of the spheres?

Select the correct answer from the list: E =

[ ] [N/C]

5. [4 points] What is the magnitude of the electric field at r = 5 cm from the center of the spheres?

Select the correct answer from the list: E =

[ ] [N/C]

6. [4 points] What is the net electric flux through the spherical surface of radius r = 5 cm from the center of the spheres?

Select the correct answer from the list: Φ =

[N.m²/C]

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Question 7

Not yet answered

Marked out of 5.00

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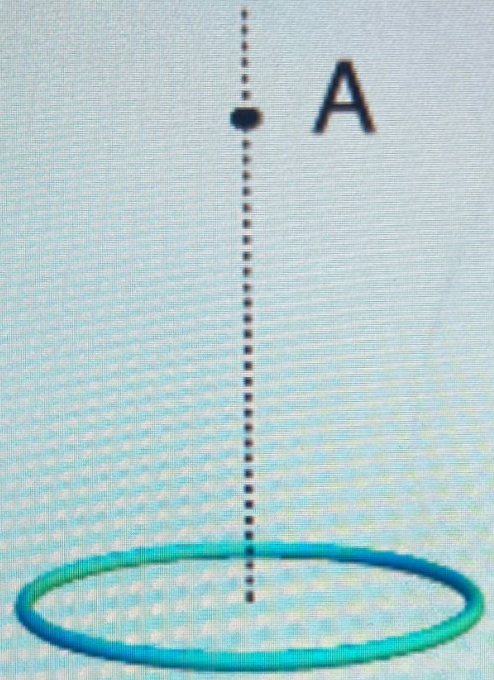
[5 points] The ring below is uniformly charged with a **positive** charge. What is the direction of the electric field vector at point A?



Select one:

- a. Left
- b. Right
- c. Down
- d. Up

Question **8**

Not yet answered

Marked out of 5.00

Flag question

[5 points] Two large metal sheets having surface charge density $+\sigma$ and $-\sigma$ are kept parallel to each other at a small separation distance d. The electric field at any point in the region between the plates is

Select one:

- $\frac{\sigma}{\epsilon_0}$
- $\frac{\sigma}{4\epsilon_0}$
- $\frac{2\sigma}{\epsilon_0}$
- $\frac{\sigma}{2\epsilon_0}$

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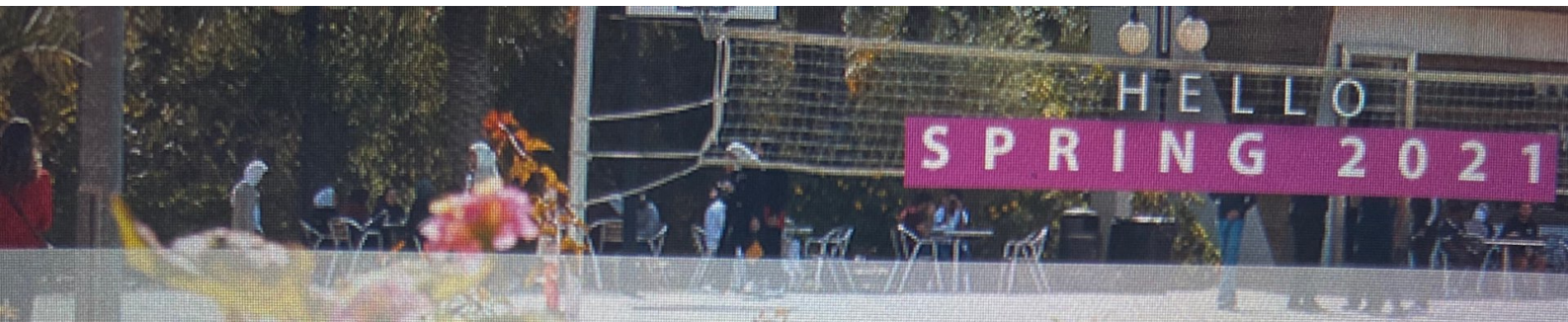

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Question **9**

Not yet answered

Marked out of 5.00

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[5 points] Inside a solid charged sphere, the electric field is ZERO.

Select one:

- True
- False

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Question **10**

Not yet answered

Marked out of 5.00

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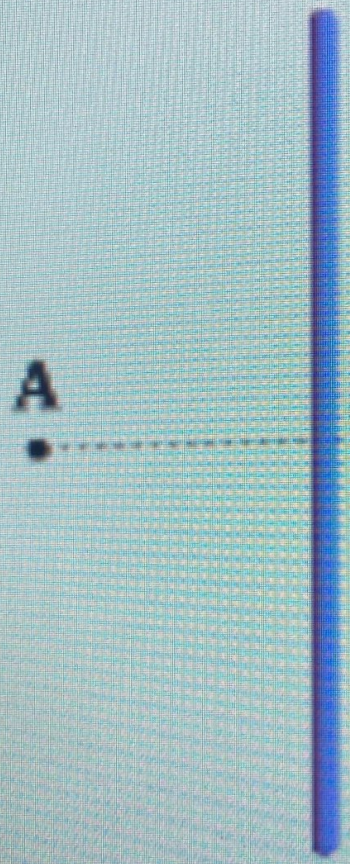
[5 points] The rod below is uniformly charged with a **negative** charge. What is the direction of the electric field vector at point A?



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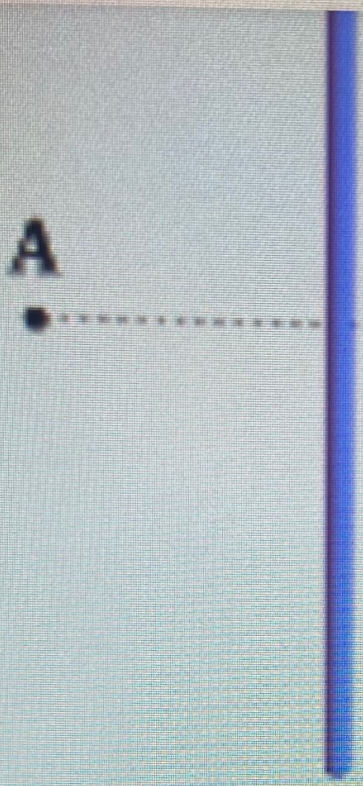

Select one:

- a. Right
- b. Down
- c. Left
- d. Up

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Question **11**

Not yet answered

Marked out of 5.00

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[5 points] At the center of a charged spherical shell, the electric field is ZERO.

Select one:

- True
- False

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