

24-03

0.51-63%

Question 509

A charged conducting spherical shell with an outer radius of 2.0 m has a point charge of +3.0 micro-Coulomb at its center. The electric field at a distance of 3.0 from the center has a magnitude of 1.2×10^4 N/C and is radially outward. What is the charge on the outer surface of the shell?

- (a) +12 micro-Coulomb
- (b) -12 micro-Coulomb
- (c) +6 micro-Coulomb
- (d) -3 micro-Coulomb
- (e) +3 micro-Coulomb

24-03

0.54-50%

Question 510

If a rectangular area is turned in a uniform electric field from a position where the maximum electric flux goes through it to a position where only half the maximum flux goes through it, what is the turned angle?

- (a) 45 degrees
- (b) 30 degrees
- (c) 90 degrees
- (d) 23 degrees
- (e) 60 degrees

24-4 Gauss' Law

24-04

0.41-45%

Question 511

A point charge $Q = 6$ micro-C is placed at the center a rectangular box with dimensions $a = b = 0.4$ m and $c = 0.6$ m. Find the total electric flux through the surface of the box.

- (a) 6.78×10^5 N*m²/C
- (b) 10.9×10^4 N*m²/C
- (c) 3.21×10^5 N*m²/C
- (d) Zero
- (e) 9.30×10^5 N*m²/C

24-04

0.14-30%

Question 512

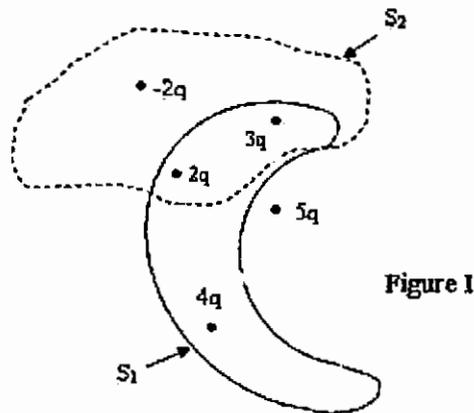
Charges q and Q are placed on the x axis at $x = 0$ and $x = 2.0$ m, respectively. If $q = -40$ pico-C and $Q = +30$ pico-C, determine the net electric flux through a spherical surface of radius 1.0 m centered on the origin.

- (a) -8.5 N*m²/C
- (b) -1.1 N*m²/C
- (c) -4.5 N*m²/C
- (d) -9.6 N*m²/C
- (e) -6.8 N*m²/C

24-04

Question 513

In figure (1), what is the ratio of the electric flux that penetrates surface S1 to that penetrates surface S2? (Note that S1 and S2 are closed surfaces and q is a charge.)



- (a) 2.
 (b) 1.3.
 (c) 0.
 (d) 3.
 (e) 1.0.

24-04

0.44-48%

Question 514

A point charge, $q_1 = -2.0 \times 10^{-6}$ C, is placed inside a cube of side 5.0 cm, and another point charge $q_2 = 3.0 \times 10^{-6}$ C is placed outside the cube. Find the net electric flux through the surfaces of the cube.

- (a) $+3.4 \times 10^5$ N m²/C
 (b) -2.3×10^5 N m²/C
 (c) 2.3×10^5 N m²/C
 (d) 1.1×10^7 N m²/C
 (e) -1.1×10^5 N m²/C

24-04

0.37-71%

Question 515

A total charge of 5.00×10^{-6} C is uniformly distributed inside an irregularly-shaped insulator. The volume of the insulator is 3.0 m^3 . Now, imagine a cube of volume 0.50 m^3 inside the insulator. What is the total electric flux through the surfaces of the cube?

- (a) 2.5×10^3 N m²/C.
 (b) Zero.
 (c) 4.5×10^5 N m²/C.
 (d) 3.1×10^5 N m²/C.
 (e) 9.4×10^4 N m²/C.

24-04

)09-83%

Question 516

Charge is uniformly distributed over the entire xy plane with a surface charge density of 20 micro-Coulomb/m². A sphere has a radius of 1.0 m, and is centered at the origin. What is the net electric flux through the surface of the sphere?

- (a) $2.8 \times 10^{17} \text{ N}\cdot\text{m}^2/\text{C}$
- (b) $1.4 \times 10^{17} \text{ N}\cdot\text{m}^2/\text{C}$
- (c) zero
- (d) $7.1 \times 10^{16} \text{ N}\cdot\text{m}^2/\text{C}$
- (e) $2.2 \times 10^{16} \text{ N}\cdot\text{m}^2/\text{C}$

24-04

)35-74%

Question 517

An imaginary closed spherical surface S of radius R is centered on the origin. A positive charge is originally at the origin, and the flux through the surface is Φ . The positive charge is slowly moved from the origin to a point $2R$ away from the origin. In doing so the flux through S

- (a) decreases to $\Phi/4$.
- (b) remains the same Φ .
- (c) increases to 2Φ .
- (d) decreases to zero.
- (e) increases to 4Φ .

24-04

)30-40%

Question 518

Figure 1 shows three situations in which a Gaussian cube sits in an electric field. The arrows and the values indicates the directions (in $\text{N}\cdot\text{m}^2/\text{C}$) of the flux through the six sides of each cube. In which situations does the cube enclose, a positive net charge, a negative net charges and zero net charge? respectively.

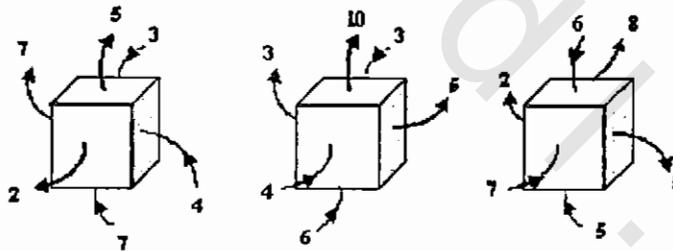


Figure 1

- (a) 1,3 and 2.
- (b) 2,1 and 3.
- (c) 2,3 and 1.
- (d) 3,2 and 1.
- (e) 1,2 and 3.

24-04

)40-29%

Question 519

The net electric flux passing through a closed surface is $-4.00 \times 10^{12} \text{ N}\cdot\text{m}^2/\text{C}$. What is net electric charge contained inside the surface if the surface is a cylinder of height 3.52 cm and radius 1.12 cm.

- (a) $-3.54 \times 10^{19} \text{ C}$.
- (b) $1.00 \times 10^{19} \text{ C}$.
- (c) $-1.00 \times 10^{19} \text{ C}$.
- (d) zero.
- (e) $3.54 \times 10^{19} \text{ C}$.