

Question 49323-09  
0.34-19%

Which one of the following statements is WRONG?

- (a) Electric field lines form a vector field.
- (b) The principle of superposition applies to electric fields as well as electrostatic forces.
- (c) Electric field lines extend away from negative charges and toward positive charges.
- (d) The electric dipole consists of two charges having the same magnitude but opposite sign.
- (e) When an electric dipole is placed in a uniform external electric field, the net force on it is zero.

Question 49423-09  
0.20-57%A proton is located at the origin and an electron is located on the y axis at  $y = +1.0$  mm. What is the electric dipole moment of these two particles? ( $i$  and  $j$  are the unit vectors in the x and y directions, respectively)

- (a)  $-1.6 \times 10^{-22} i$  (C.m)
- (b)  $+1.6 \times 10^{-22} i$  (C.m)
- (c)  $+1.6 \times 10^{-22} j$  (C.m)
- (d) zero
- (e)  $-1.6 \times 10^{-22} j$  (C.m)

Question 49523-11  
0.38-49%A point charge ( $q = -10.0$  micro-C) is at the center of a metallic sphere that has a radius of 20.0 cm. The electric field 0.500 m away from the center of the sphere is found to be -432 kV/m. What is the charge density on the metallic sphere?

- (a) 400 micro-C/m<sup>2</sup>
- (b) 4.00 C/m<sup>2</sup>
- (c) -4.00 C/m<sup>2</sup>
- (d) -4.00 micro-C/m<sup>2</sup>
- (e) 4.00 micro-C/m<sup>2</sup>.

24-2 flux

24-02

Question 496A uniform electric field  $E = (a i + b j)$  intersects a surface of area  $A$ . If the surface of the area  $A$  lies in YZ-plane, the flux through the area will be:

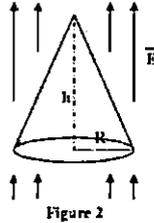
- (a)  $b \cdot A$ .
- (b) Zero.
- (c)  $a \cdot A$ .
- (d)  $a \cdot b$ .
- (e)  $A \cdot A$ .

Question 49724-02  
0.56-55%When a piece of paper is held with one face perpendicular to a uniform electric field, the electric flux is  $48 \text{ N} \cdot \text{m}^2/\text{C}$ . When the plane of the paper makes 30 degrees with the direction of the electric field the electric flux through it is:

- (a)  $24 \text{ N} \cdot \text{m}^2/\text{C}$
- (b)  $44 \text{ N} \cdot \text{m}^2/\text{C}$
- (c)  $21 \text{ N} \cdot \text{m}^2/\text{C}$
- (d)  $48 \text{ N} \cdot \text{m}^2/\text{C}$
- (e)  $32 \text{ N} \cdot \text{m}^2/\text{C}$

Question 49824-02  
0.00-66%

Calculate the electric flux ( $\phi$ ) through the curved surface of a cone of base radius  $R$  and height  $h$ . The electric field  $E$  is uniform and perpendicular to the base of the cone, and the field lines enter through the base. The cone has no charge enclosed in it, as seen in figure (2).



- (a)  $\pi R h E$ .  
 (b)  $-2\pi R^2 E$ .  
 (c)  $2\pi R^2 E$ .  
 (d)  $-\pi(R^2)E$ .  
 (e)  $\pi(R^2)E$ .

Question 49924-02  
0.16-76%

Two concentric shells, one with radius  $R$  and the other with radius  $2R$ , surround an isolated point charge. The ratio of the number of field lines through the larger shell to the number of field lines through the smaller is:

- (a)  $1/4$ .  
 (b)  $1$ .  
 (c)  $1/2$ .  
 (d)  $4$ .  
 (e)  $2$ .

Question 500

24-02

For the electric field:

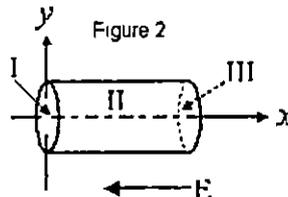
$$E = (24 \mathbf{i} + 30 \mathbf{j} + 16 \mathbf{k}) \text{ N/C},$$

where  $\mathbf{i}$ ,  $\mathbf{j}$ , and  $\mathbf{k}$  are the unit vectors in the directions of  $x$ ,  $y$ , and  $z$ , respectively, the electric flux through a  $2.0 \text{ m}^2$  portion of the  $yz$ -plane is:

- (a)  $60 \text{ N}\cdot\text{m}^2/\text{C}$ .  
 (b)  $92 \text{ N}\cdot\text{m}^2/\text{C}$ .  
 (c)  $48 \text{ N}\cdot\text{m}^2/\text{C}$ .  
 (d)  $32 \text{ N}\cdot\text{m}^2/\text{C}$ .  
 (e)  $80 \text{ N}\cdot\text{m}^2/\text{C}$ .

Question 50124-02  
0.51-34%

A closed cylinder whose main axis is along the  $x$ -axis is shown in figure 2. It is placed in a uniform electric field of magnitude  $200 \text{ N/C}$  pointing in the negative  $x$ -axis. The cylinder has a cross sectional area of  $12.5 \text{ cm}^2$  and a length of  $6.0 \text{ cm}$ . The fluxes through faces I, II and III are respectively:



- (a) zero,  $0.25$ , zero  $\text{N}\cdot\text{m}^2/\text{C}$   
 (b) zero,  $-0.25$ , zero  $\text{N}\cdot\text{m}^2/\text{C}$   
 (c)  $-0.25$ , zero,  $0.25 \text{ N}\cdot\text{m}^2/\text{C}$   
 (d)  $-0.25$ ,  $0.25$ ,  $-0.25 \text{ N}\cdot\text{m}^2/\text{C}$   
 (e)  $0.25$ , zero,  $-0.25 \text{ N}\cdot\text{m}^2/\text{C}$