1 Electricity and Magnetism

1.2. The Electric Field

Electric Field Strength

A 1. An electric force of 12 N is acting on the charge 4 μC at any point. Calculate the strength of the electric field at that point. B+ C+

A 2. A small electric charge, Q = 5 mC, is located a uniform electric field E = 4.2 N/C. Determine the force of the charge. B+ C+

A 3. Read the statements below. Circle the correct statements and correct the wrong ones. A+ B+

Statement	Correct	Incorrect
When an insulator is placed in an electric field, the strength of the electric field increases.		
The electric field inside the conductor is zero, because the free charges reside on the surface.		
The electric field can be under specific conditions negative.		
The electrons in an electric field move in a direction to the same field.		

LÖSUNGEN

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Electric Field Strength

A 1. An electric force of 12 N is acting on the charge 4 µC at any point. Calculate the strength of the electric field at that point. B+ C+

The strength of the electric field is given by the formula: $E = \frac{F}{Q} = \frac{12\ N}{4\ \mu C} = \frac{12\ N}{4 \cdot 10^{-6} C} = 3 \cdot 10^6\ N/C.$

A 2. A small electric charge, Q = 5 mC, is located a uniform electric field E = 4.2 N/C. Determine the force of the charge. B+ C+

The strength of the electric field is given by the formula: $E = \frac{F}{Q}$*. By rearranging this formula, we receive for the force as follows:* $F = E \cdot Q = 4.2 N/C \cdot 5 \cdot 10^{-3} C = 21 mN.$

A 3. Read the statements below. Circle the correct statements and correct the wrong ones. A+ B+

Statement	Correct	Incorrect
When an insulator is placed in an electric field, the strength of the electric field increases. (decreases)		√
The electric field inside the conductor is zero, because the free charges reside on the surface.	√	
The electric field can be under specific conditions negative. (can never be negative)		√
The electrons in an electric field move in a direction to the same field. (to an opposite field)		√