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1. Coulomb is the unit of which quantity?
a) Field strength
b) Charge
c) Permittivity
d) Force
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Answer: b
Explanation: The standard unit of charge is Coulomb. One coulomb is defined as the 1 Newton of force applied on 1 unit of electric field.

2. Coulomb law is employed in
a) Electrostatics
b) Magnetostatics
c) Electromagnetics
d) Maxwell theory
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Answer: a
Explanation: Coulomb law is applied to static charges. It states that force between any two point charges is proportional to the product of the charges and inversely proportional to square of the distance between them. Thus it is employed in electrostatics.

3. Find the force between 2C and -1C separated by a distance 1m in air(in newton).
a) 18×10^6
b) -18×10^6
c) 18×10^{-6}
d) -18×10^{-6}
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Answer: b
Explanation: $F = q1q2/(4\prod\varepsilon or^2) = -2 \times 9/(10^{-9} \times 12) = -18 \times 10^9$.

4. Two charges 1C and -4C exists in air. What is the direction of force?
a) Away from 1C
b) Away from -4C
c) From 1C to -4C
d) From -4C to 1C
View Answer

Answer: c
Explanation: Since the charges are unlike, the force will be attractive. Thus the force directs from 1C to -4C.

5. Find the force of interaction between 60 stat coulomb and 37.5 stat coulomb spaced 7.5cm apart in transformer oil($\varepsilon r=2.2$) in 10^{-4} N,
a) 8.15
b) 5.18

c) 1.518
d) 1.815
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Answer: d
Explanation: 1 stat coulomb = $1/(3 \times 10^9)$ C
$F = (1.998 \times 1.2488 \times 10^{-16})/(4\prod \times 8.854 \times 10^{-12} \times 2.2 \times (7.5 \times 10^{-2})^2) = 1.815 \times 10^{-4}$ N.

6. Find the force between two charges when they are brought in contact and separated by 4cm apart, charges are 2nC and -1nC, in μN.
a) 1.44
b) 2.44
c) 1.404
d) 2.404
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Answer: c
Explanation: Before the charges are brought into contact, F = 11.234 μN.
After charges are brought into contact and then separated, charge on each sphere is, $(q1 + q2)/2 = 0.5$nC
On calculating the force with q1 = q2 = 0.5nC, F = 1.404μN.

7. The Coulomb law is an implication of which law?
a) Ampere law
b) Gauss law
c) Biot Savart law
d) Lenz law
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Answer: b
Explanation: The Coulomb law can be formulated from the Gauss law, using the divergence theorem. Thus it is an implication of Gauss law.

8. Two small diameter 10gm dielectric balls can slide freely on a vertical channel. Each carry a negative charge of 1μC. Find the separation between the balls if the lower ball is restrained from moving.
a) 0.5
b) 0.4
c) 0.3
d) 0.2
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Answer: c
Explanation: $F = mg = 10 \times 10^{-3} \times 9.81 = 9.81 \times 10^{-2}$ N.
On calculating r by substituting charges, we get r = 0.3m.

9. A charge of 2×10^{-7} C is acted upon by a force of 0.1N. Determine the distance to the other charge of 4.5×10^{-7} C, both the charges are in vacuum.
a) 0.03
b) 0.05

c) 0.07
d) 0.09
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Answer: d
Explanation: $F = q_1q_2/(4\prod\varepsilon_0 r^2)$, substituting q1, q2 and F, r2 = q1q2/(4$\prod$εoF) =
We get r = 0.09m.

10. For a charge Q1, the effect of charge Q2 on Q1 will be,
a) F1 = F2
b) F1 = -F2
c) F1 = F2 = 0
d) F1 and F2 are not equal
View Answer

Answer: b
Explanation: The force of two charges with respect with each other is given by F1 and F2.
Thus F1 + F2 = 0 and F1 = -F2.