

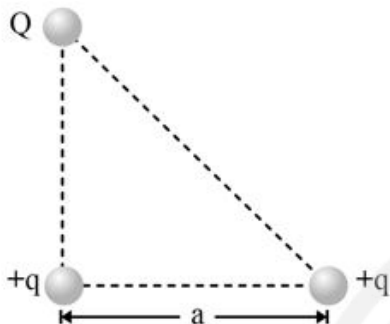
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Physics

DPP: 6

Electrostatic Potential and Capacitance

- Q1** Three charges Q , $+q$ and $+q$ are placed at the vertices of a right-angled isosceles triangle as shown. The net electrostatic energy of the configuration is zero if Q is equal to :



- (A) $\frac{-q}{1+\sqrt{2}}$ (B) $\frac{-2q}{2+\sqrt{2}}$
 (C) $-2q$ (D) $+q$
- Q2** A cube of a metal is given a positive charge Q . For the above system, which of the following statements is true :
- (A) Electric potential at the surface of the cube is zero
 (B) Electric potential within the cube is zero
 (C) Electric field is normal to the surface of the cube
 (D) Electric field varies within the cube
- Q3** The capacity of a spherical conductor in SI system is:
- (A) $\frac{R}{4\pi\epsilon_0}$
 (B) $\frac{4\pi\epsilon_0}{R}$
 (C) $4\pi\epsilon_0 R$
 (D) $4\pi\epsilon_0 R^2$

Q4

A glass slab is put within the plates of a charged parallel plate which of the following quantities does not change?

- (A) Energy (B) Capacitance
 (C) Voltage (D) Charge

- Q5** The radius of a metallic sphere if its capacitance is $1/9F$, is:
- (A) 10^6 m (B) 10^7 m
 (C) 10^9 m (D) 10^8 m

- Q6** If the capacity of a spherical conductor is 1 pico-farad, then its diameter, would be:
- (A) 1.8×10^{-3} m
 (B) 18×10^{-3} m
 (C) 1.8×10^{-5} m
 (D) 18×10^{-7} m

- Q7** The capacity of a parallel plate condenser is $5mF$. When a glass plate is placed between the plates of the conductor, its potential becomes $1/8$ th of the original value. The value of dielectric constant will be:
- (A) 1.6 (B) 5
 (C) 8 (D) 40

- Q8** The insulated spheres of radii R_1 and R_2 having charges Q_1 and Q_2 respectively are connected to each other. There is :
- (A) No change in the energy of the system
 (B) An increase in the energy of the system
 (C) Always a decrease in the energy of the system
 (D) A decrease in the energy of the system unless $Q_1 R_2 = Q_2 R_1$



Answer Key

Q1 (B)

Q2 (C)

Q3 (C)

Q4 (D)

Q5 (C)

Q6 (B)

Q7 (C)

Q8 (D)



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