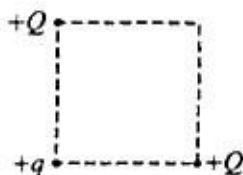


Questions 39-40



As shown above, two particles, each of charge  $+Q$ , are fixed at opposite corners of a square that lies in the plane of the page. A positive test charge  $+q$  is placed at a third corner.

39. What is the direction of the force on the test charge due to the two other charges?

- (A)
- (B)
- (C)
- (D)
- (E)

40. If  $F$  is the magnitude of the force on the test charge due to only one of the other charges, what is the magnitude of the net force acting on the test charge due to both of these charges?

- (A) Zero
- (B)  $F/\sqrt{2}$
- (C)  $F$
- (D)  $\sqrt{2} F$
- (E)  $2 F$

41. Gauss's law provides a convenient way to calculate the electric field outside and near each of the following isolated charged conductors EXCEPT a

- (A) large plate
- (B) sphere
- (C) cube
- (D) long, solid rod
- (E) long, hollow cylinder

42. A wire of resistance  $R$  dissipates power  $P$  when a current  $I$  passes through it. The wire is replaced by another wire with resistance  $3R$ . The power dissipated by the new wire when the same current passes through it is

- (A)  $\frac{P}{9}$
- (B)  $\frac{P}{3}$
- (C)  $P$
- (D)  $3P$
- (E)  $6P$