Thunderstorms generally develop in the late afternoon or evening hours, when moist, daytime air rises into the upper atmosphere as temperatures cool and denser, night-time air slides in underneath. Clouds of water droplets, generally supercooled (droplets whose temperature has fallen below 0 degrees Celsius but have not yet frozen), condense around dust particles in the air until a critical density is reached, at which point it begins to rain. Cloud-to-ground lightning occurs when a discrepancy in electric charge develops between a cloud and the earth. For reasons that are not widely agreed upon, a charge begins to build up in this mixed water and ice region. When this discrepancy reaches a certain "breakdown potential," the surge of electric charge known as lightning moves downward between the negative and positive charge centres in 50-yard sections called step leaders. Eventually, it encounters something on the ground that is a good connection, and, with the circuit complete, the charge is lowered from cloud to ground. This entire event usually takes less than half a second. It is by preventing the requisite charge polarization that scientists hope someday to discourage the creation of cloud-to-ground lightning, thereby making storms safer and easier to ―weather.‖  
  
Many authorities adhere to a hypothesis for cloud electrification theory which emphasizes that the charging process occurs when a supercooled droplet of water collides with an ice particle of precipitation size (a hailstone)—the precipitation model. At this moment a large portion of the droplet freezes—resulting in a negative charge on the forming hailstone—while a smaller portion, still lingering in its supercooled state, dissociates itself—taking on a positive charge. The relatively heavy hailstone, responding to gravity, then begins to fall, while the extremely light supercooled droplet is carried by updrafts to higher regions of the cloud. Assuming the veracity of this account of charge separation, scientists guess that they would be able to discourage polarization by reducing the quantity of supercooled water in a cloud. To this purpose they have conducted preliminary seeding experiments, in which they have attempted to initiate the freezing of excess water by dropping large quantities of dry ice and silver iodide into potential thunderclouds, the results of which are, however, as yet inconclusive.  
  
A more recent convection model of the polarization process is offered by Bernard Vonnegut and Charles B. Moore, who contend that the primary cause of electrical charge formation in clouds is the capture of ionized (electrically charged) gas molecules by water droplets. The ions, so the theory goes, are absorbed by the droplets and transported by updrafts and downdrafts to various portions of the cloud. Vonnegut and Moore suggest that, in order to combat the effects of this transport of ions, it would be necessary to modify the properties of ions beneath accumulating clouds. In support of this explanation of cloud polarization they conducted a series of "space charge" experiments. Suspending a high-voltage wire above nine miles of Illinois countryside, Vonnegut and Moore released large quantities of ions into the atmosphere below, forming clouds. By means of airplanes specially equipped for electrical measurements, they determined that the ions were being distributed to differing regions of the clouds.

1. Which of the following options best summarizes the author‘s main point in the passage?

A. Several recent breakthroughs have increased our understanding of the causes of lightning.

B. Charge polarization in clouds can result both from the freezing of supercooled droplets and from the modification of ion properties.

C. The standard explanation of the causes of lightning is inaccurate and should be modified.

D. Scientists are not yet agreed on either the causes of cloud-to-ground lightning or the methods of controlling it.

E. To argue in favour of one model of polarization process

2. It can be inferred from the information in the passage that the term "breakdown potential" as used in line 13 of the passage refers to:

A. a charge polarity sufficient to cause lightning.

B. the intensity of the lightning bolt.

C. the distance between the negatively charged earth and the positively charged cloud.

D. the duration of the lightning event

E. the point at which a cloud breaks down

3. According to points made in the passage by the author, scientists agree that lightning can occur when:

A. ions are transported by updrafts to higher regions of a thundercloud.

B. supercooled droplets collide with hailstones in clouds.

C. a difference in charge exists between a cloud and the ground.

D. dry ice is released into a potential thundercloud.

E. there is high moisture content in the atmosphere

4. Which of the following statements would be LEAST consistent with the account of cloud polarization offered by Vonnegut and Moore?

A. Charge is transported within clouds via updrafts and downdrafts.

B. Lightning is caused by a discrepancy in electric charge between a cloud and the ground.

C. Water droplets are capable of carrying an electrical charge.

D. Lightning occurs when positively and negatively charged droplets are absorbed by hailstones.

E. The main cause of electrical charge formation is the capture of ionized gas molecules