

24. (d)

Statement 1 is correct: A geomagnetic storm is a major disturbance of Earth's magnetosphere that occurs when there is a very efficient exchange of energy from the solar wind into the space environment surrounding Earth.

Statement 2 is correct: The increase in the solar wind pressure initially compresses the magnetosphere. The solar wind's magnetic field interacts with the Earth's magnetic field and transfers an increased energy into the magnetosphere. Both interactions cause an increase in plasma movement through the magnetosphere and an increase in electric current in the magnetosphere and ionosphere. During the main phase of a geomagnetic storm, electric current in the magnetosphere creates a magnetic force that pushes out the boundary between the magnetosphere and the solar wind.

Statement 3 is correct: Auroras occur when charged particles ejected from the Sun's surface called the solar wind enter the Earth's atmosphere. The fast-moving solar wind which disrupts the magnetosphere. The electromagnetic storm could cause the Northern Lights to be visible in more number of areas than usual.

25. (a)

Statement 1 is correct: A tectonic plate (also called lithosphere plate) is a massive, irregularly shaped slab of solid rock, generally composed of both continental and oceanic lithosphere. These plates move horizontally over the asthenosphere as rigid units. Continents are part of a plate and what moves is the plate.

Statement 2 is not correct: Tectonic plates are able to move because the Earth's lithosphere has greater mechanical strength than the underlying asthenosphere. Lateral density variations in the mantle result in convection; that is, the slow creeping motion of Earth's solid mantle. Plate movement is thought to be driven by a combination of the motion of the seafloor away from spreading ridges due to variations in topography and density changes in the crust.

Statement 3 is not correct: Recently China and Nepal reported that Mount Everest in Himalayas have grown 0.86cm higher when compared with data collected in 1954, now the height of the mountain is 8848.86 metres.

26. (c)

Statement 1 is correct: A hurricane is a type of storm called a tropical cyclone, which forms over tropical or subtropical waters. A hurricane starts out as a tropical disturbance. This is an area over warm ocean waters where rain clouds are building.

Statement 2 is correct: Hurricanes originate in the Atlantic basin, which includes the Atlantic Ocean, Caribbean Sea, and Gulf of Mexico, the eastern North Pacific Ocean, and, less frequently, the central North Pacific Ocean. A six-year rotating list of names, updated and maintained by the World Meteorological Organization, is used to identify these storms.

Statement 3 is not correct: A tropical storm becomes a hurricane if its winds reach 119 km/hr (74 mph). The storm is at least 50,000 feet high and around 125 miles across. The eye is around 5 to 30 miles wide.

27. (a)

Statement 1 is correct: The Indian Ocean Dipole - often called the "Indian Niño" because of its similarity to its Pacific equivalent - refers to the difference in sea-surface temperatures in opposite parts of the Indian Ocean.

The dipole's positive phase this year - the strongest for six decades - means warmer sea temperatures in the western Indian Ocean region, with the opposite in the east.

Statement 2 is not correct: The result of a strong positive dipole is a higher-than-average rainfall and floods in eastern Africa and droughts in south-east Asia and Australia.

When an Indian Ocean dipole event occurs, the rainfall tends to move with the warm waters, so you get more rainfall than normal over the East African countries.

A negative dipole phase would bring about the opposite conditions - warmer water and greater precipitation in the eastern Indian Ocean, and cooler and drier conditions in the west.