

1.The Earth bulges out at equator. Why?

Ans: This is due to the shape of the earth. The earth is not a true sphere but it is an ellipsoid. The equatorial diameter of the earth is 12756.27 kms. While its polar diameter is 12713.505 km. the difference between its equatorial and polar diameter is about 43 kilometers. The rotation of the earth on its axis produces a centrifugal force which increases its equatorial diameter. That is why earth bulges at the equator.

2.The Sun appears red at sunset and sunrise. Why?

Ans: The sun appears red at the time of sunset and sunrise due to the scattering of light by small particles of dust or smoke near the surface of the earth. The light travels relatively without hindrance that is why the sun appears red at the time of sunset and sunrise.

3.The ozone layer in the atmosphere is necessary for our survival. Why?

Ans: ozone layer in the atmosphere is very necessary for plant and animal survival because it is the absorber of ultraviolet rays which are very dangerous for animal health. Ultraviolet rays cause cancer of skin, spotting of plants etc. that is why the ozone layer is necessary and essential for animal as well as plant survival.

4.The sky from moon appears black. Why?

Ans: as the moon has no atmosphere, so the sky looks completely black when viewed from the moon.

5) Roads are bent inwards on curves. Why?

Ans: The roads are bent inwards on the curves and at the turns because the bents avoid falling outside and prevent the accidents. OR When an object turns in a circle it is influenced by a centrifugal force which pushes it away from the centre of the circle. When vehicles turn on a road they fall outside under the influence of centrifugal force. In this way there is danger of falling or slipping out of road at a turn. Roads are made in a way that these bent inward at the turns to avoid falling outside and to prevent accidents.

6) Australian continent has winter season when we have summer season in Pakistan.

Ans: the earth on its axis is not at a vertical angle to its orbit. It is inclined at an angle of about. In this way when the northern hemisphere of the earth is inclined to the sun and getting direct sun rays, southern hemisphere is inclined away from the sun and getting less direct rays. Thus the northern hemisphere has summer season and southern hemisphere has winter season. Pakistan is in the northern hemisphere while Australia is in the southern hemisphere. So when there is winter in Australia there is summer season in Pakistan.

7.Meat takes longer to cook on mountains.

Ans: The meat takes longer time to cook on the mountains because the atmospheric pressure decreases with attitude and the boiling point of a liquid is directly proportional to the atmospheric pressure.

8. Water remains cool in earthen pitcher.

Ans: This occurs due to the process of evaporation. Water gets cooled on evaporation. As the earthenware pitcher is concerned, they have small pores. Water tends to come out of pores and evaporates which results in cooling effect on the earthenware and water. While in the metal pots there are no pores and evaporation does not take place. Besides metal has tendency to absorb heat that why water does not get cooled in a metal pot.

9. Ice and salt mixture is used as a freezing agent by manual ice-cream makers.

Ans: In manual ice-cream making a mixture of salt and ice is always used because salt has capacity to reduce the temperature of ice by decreasing its freezing point. That's why ice and salt mixture is used as freezing agent in manual ice cream making.

10. It is not advisable to sleep under trees during the night.

Ans: During night the plants release carbon dioxide (CO₂) which is a poisonous gas and injurious to health. That is why it is not advisable to sleep under trees during night.

11. Why the green house operators paint their glass roofs white in summer?

Ans: White colour is the reflector of light and it absorbs less heat as compared to other colours. As in summer there is already very hot season and heat is not required to that level. That is why the green-house operators paint glass roofs white in summer season.

12) Water boils quicker on mountains.

Ans: On Mountains the pressure of the air is low due to height, as the air pressure decreases with altitude. In this way, water boils quicker on mountains at temperature less than 100 degree centigrade, which is the boiling point of water at ground level.

13. Rainbow is produced in the sky after rainfall and sunlight.

Ans: After rain, many droplet of water travel in the atmosphere. When sun rays fall on these droplets, dispersion of water occurs and droplets act as prism and produce a spectrum of seven colours. That's why a rainbow is seen in the sky after rain.

14. Milk is considered as an ideal food.

Ans: Milk is considered as an ideal food due to following reasons: a) It contains all constitute of balanced diet. b) Milk contains fat. c) Milk has high nutritional value because it contains proteins as well as minerals.

15. Lunar eclipse last much longer than solar eclipse.

Ans: Lunar eclipse last longer than the solar eclipse because the length of the earth's umbral shadow cone is more than three times the average distance between the moon and the earth, so the shadow is relatively wide at the point where the moon crosses it.

16. Goitre is common in hilly areas.

Ans: Goitre is common in hilly areas because there is deficiency of Iodine in the water.

17) Detergents are better cleaning agents.

Ans: A detergent consists of hydrophilic and hydrophobic ends. In case of dirt the detergent pushes the dirt off the wet surface of the fabric. The washing machine provides the agitation.

18) Decomposers are important for life.

Ans: Decomposers break down animal waste and dead organisms in order to get energy and release free nutrients back into the ecosystem.

OR

Decomposers break down organics into nutrients, which can be used by living organisms to create new life.

19) Places near sea are cooler in summer.

Ans: Sea water keeps the temperature moderate. In the summer season the places located near sea are cooler due to the lower temperature of water.

20) Colour blindness is more common in men than women.

Ans: Women have the sex chromosomes XX, while men have the chromosomes XY. The gene for normal colour vision is found on the X-chromosome. If a woman has one X-chromosome with the gene and one without it, she will not be colour blind. On the other hand, a man with an X-chromosome that is missing the gene has no 'backup'. He will definitely be colour blind. Colour blind women have both X-chromosomes missing the colour vision gene. This is less probable mathematically than having just one X-chromosome missing the gene.

21) Light colours absorb less heat therefore these are not heated as much as the black colour.

Ans: Dark colours do not exactly absorb more heat, but they do convert a higher percentage of light into heat. In the sun with a dark coloured shirt it gets hot, where a lighter coloured shirt would not get nearly as hot. This is due to the amount of light being absorbed by the colour. The lighter the colour the smaller is the range of visible light being absorbed and converted into heat. White objects reflect all visible light, where black objects absorb all visible light.

22) Rain water is more fertile than water from tube well.

Ans: Rain water is more fertile because it contains many salts and nitrogen dissolved from the atmosphere.

23) The manhole covers are generally round.

Ans: Manholes, which interconnect underground sewerage pipes, and serve as a point of entry for cleaning the pipes, are located at every major sewer pipe junction, and are capped with round manhole covers. The reason for the circular construction of these covers is, quite simply, that covers of any other shape would fall through the manholes by virtue of their varying diameters. Circular manhole covers do not vary in width, or in diameter, as is the case with these other shapes, thus remaining in place despite the street traffic running roughshod over them.

24) Clothes of a moving dancer bulge.

Ans: The clothes of a moving dancer bulge outside due to the centrifugal force which tends to move away from the centre.

25) People are advised not to stand near fast moving train.

Ans: One should not stand beside a fast moving train because of the strong pressure of air which carries along. A man can fall in this pressure.

26) The image of a tree is inverted on the bank of a lake.

Ans: The water of lake acts as a mirror. According to the laws of light, mirror forms inverted images.

27) Polar star is always seen in the north.

Ans: It is because the Polar Star (North Star) is closest to the location of the celestial North Pole.

28) We never see birds urinating.

Ans: The birds do not have a urinary system like other living beings which possess urinary excretory organs. In the birds the urine is excreted from body without special organs.

29) Pasteurized milk has more nourishment than the ordinary boiled milk.

Ans: Pasteurized milk is obtained by heating milk at a temperature of 60 degree Celsius for 30 minutes. In this way the TB bacteria are killed without damaging the milk protein. Thus pasteurized milk has more nourishment than ordinary boiled milk.

30) Bees die when they sting human being.

Ans: Their stingers are actually ovipositors, tubular structures extending from the abdomen that sometimes contain eggs. When the barbed stinger is left inside the victim, the honeybee mortally tears her abdomen in the process. They leave their stingers in the wound with a tiny venom sac attached.

Fortunately, only about one out of a hundred people are allergic to bee sting, but allergic reactions can be very serious.

31) Cloudy nights are usually warmer than the clear ones.

Ans: The clouds serve as a barrier and prevent the loss of heat. Thus the warm temperature is maintained.

32) Why do some people snore?

Ans: Some people snore during their sleep because the breathing action produces sound. This is so because the pharynx or the windpipe offers resistance to the air taken in or expelled.

33) Why do we sometimes sleep walk?

Ans: Sleep walk is a sort of disorder of sleep in which a person starts walking during his sleep. The sleeper walks and performs complex activities automatically without regaining consciousness.

34) Climbers bend forward while climbing mountain.

Ans: While climbing a mountain, a climber bends his body forward in order to keep the centre of gravity of his body within two thirds portion. According to this principle the Pisa Tower is not falling.

35) Why climbers get their food by climbing on other trees?

Ans: The climbers are mostly parasites and they cannot manufacture their food. Therefore, they climb on other trees and get food from them.

36) Mars is called red planet.

Ans: Mars is called the red planet because its colour is red due to the desert like surface.

37) Vitamin D is the essential component of the body.

Ans: Vitamin D is necessary for body because it is essential for bone formation and retention of calcium in the human body. Vitamin D also protects the teeth.

38) The weight of the object is less at the equator than at the poles.

Ans: The weight of an object is the product of mass and force of gravity. The equatorial diameter is more than the polar diameter. Thus, the force of gravity is more at the poles and the weight is more there.

39) The dogs pant, the birds open their mouth and the elephants move rapidly their ears.

Ans: All of them do not sweat; they use the above mentioned mechanisms to cool themselves.

40) A geostationary satellite appears standstill to a viewer on the equator of earth.

Ans: Because the distance remains the same.

41) Why do the stars twinkle?

Ans: The light from the stars travels through different layers of space of varying densities. Therefore, the light rays deviate from their original path. Further, these layers are not stationary but keep on moving. This leads to the twinkling of stars.

42) On what days do we have equal days and nights all over the world? And why?

Ans: On 23 September and 21 March we have equal days and nights all over the world. This is so because on these days, the rays of the sun fall vertically on the equator at noon. Both the poles receive equal rays of the sun. As a result, exactly one-half of each hemisphere receives the sun's rays. This makes day and night equal.

43) Every fourth year has 366 days. Explain.

Ans: One revolution of the earth around the sun takes 366 days and 6 hours. But we consider a year as consisting of only 365 days and ignore 6 hours. In four years the difference becomes as much as 24 hours or one day. Hence, to every fourth year we add one day. That year of 366 days is known as leap year.

44) Why are igneous rocks called primary or parent rocks?

Ans: Igneous rocks are formed when the molten material from volcanoes gets solidified. This material is liquid, hot and sticky which moves towards the surface through cracks and joints. All other rocks derived from these rocks. Hence, they are called primary or parent rocks.

45) Why are the areas lying between the Arctic Circle and the North Pole in the Northern Hemisphere and the Antarctic Circle and the South Pole in the Southern Hemisphere very cold?

Ans: These areas are very cold because the sun does not rise much above the horizon. Therefore, its rays are always very slanting which emit minimum heat. These areas being very cold are called Frigid Zones.

46) Why are the three hot regions of the world-equatorial forests, savannah lands and hot deserts-not found in Europe?

Ans: The three hot regions of the world-equatorial forests, savannah lands and hot deserts-are not found in Europe because Europe is the only inhabited continent situated entirely outside the tropics.

47) Why is the lowest layer of the atmosphere in contact with the earth's surface, the warmest?

Ans: The lowest layer of the atmosphere in contact with the earth's surface is the warmest because the atmosphere is heated mainly from the below.

48) Why does the temperature above the ocean and land masses vary even on the same latitude?

Ans: Temperature above the oceans and land masses varies even on the same latitude because of the differential heating of land and water, i.e., land mass is heated and cooled more rapidly and to a greater degree than water.

49) Why are marine animals able to live at great depths than marine plants?

Ans: As marine animals do not depend upon sunlight for their survival, they are able to live at great depths where there is permanent darkness.

50) Why do trees of coniferous forests possess needle-like leaves?

Ans: The needle-like leaves limit transpiration and thus enable conifers to grow in the drier areas.

51) Why do equatorial forests appear evergreen?

Ans: In equatorial forests trees often shed a few leaves or shed their leaves seasonally, but most of the trees retain their leaves for most of the time so that the forests appear evergreen.

52) Why is petroleum often called black gold?

Ans: Petroleum is often called black gold because of its great demand in the modern industry and for domestic use. It provides fuel for heat and lighting, lubricant for machinery and raw material for a number of industries.

53) Why are the kangaroos called marsupials?

Ans: Marsupial means broad-pouch. Since kangaroos have a pouch-like fold of skin near the stomach in which they carry their young ones, they are called marsupials.

54) Why is platypus considered a strange animal?

Ans: Platypus is a strange animal because it is an animal-bird that survives under water, walks on the ground and digs tunnel under the ground. It is a four-legged animal that lays eggs like a bird. It is found in Australia.

55) Why is a person in moving vehicle thrown forward when the vehicle stops suddenly?

Ans: A person in a moving vehicle is in a state of motion. When the vehicle suddenly stops his body tends to remain in a state of motion due to inertia and he is thrown forward.

56) Earth is continuously pulling moon towards its centre. Why does not the moon fall on to the earth?

Ans: it is so because the gravitational attraction of the earth provides the necessary centripetal force to the moon for its orbital motion around the earth due to which the moon is revolving around the earth.

57) Which of the two-glass or rubber is more elastic and why?

Ans: Glass is more elastic than rubber because for a given applied force per unit area, the strain produced in glass is much more than that produced in rubber.

58) Animal like camel can easily walk in the desert sand while other animals like donkeys, dogs and horses cannot. Explain.

Ans: The camel has very broad and large feet. As a result of the large surface area in contact with the ground, it exerts less pressure on the sand and sinks only slightly in it. Other animals have smaller feet which exert more pressure on the sand. As a result, they sink more in the sand and cannot walk easily in desert.

59) Why does a small quantity of liquid assume spherical form?

Ans: A small quantity of liquid assumes a spherical form due to surface tension which tends to reduce the surface area. A given mass will acquire minimum surface area if it assumes a spherical shape.

60) Why does an iron needle float on clean water but sink when some detergent is added to this water?

Ans: Due to surface tension, the free surface of liquid at rest behaves like a stretched membrane. When an iron needle floats on the surface of clean water, its weight is supported by the stretched membrane. When some detergent is added to this water, its surface tension decreases. As a result of it, the stretched membrane on the surface of water is weakened and is not able to support the weight of needle. Hence the needle sinks in such water.

61) Why is cooking quicker in a pressure cooker?

Ans: The boiling point of water depends upon the pressure on its surface. Steam produced inside the cooker builds up pressure thereby raising the boiling point of water, which results in quick cooking.

62) Why does steam cause more severe burns than boiling water?

Ans: The amount of heat (latent heat) possessed by steam is much greater than the amount of heat possessed by water at the same temperature. Therefore, steam causes more severe burns than boiling water.

63) Why does ice not melt readily when salt is sprinkled over it?

Ans: When salt is sprinkled over ice, some of it dissolves. As dissolution of the salt is accompanied by absorption of heat. The temperature of the system falls below 0 degree Celsius. Hence, ice does not melt readily.

64) It is difficult for firemen to hold a hose, which ejects large amount of water at a high velocity. Why?

Ans: the water which comes out of the fireman's hose carries large momentum as its velocity is very high. The equal and opposite reaction force pushes the fireman backwards with a great speed satisfying the law of conservation of momentum. As a result, it is difficult for the fireman to hold the hose.

65) In the outer space astronauts talk to each other through radios. Why?

Ans: sound waves need a material medium for its propagation. There is no air in space and hence, sound waves cannot travel. However, radio waves can travel through space. The astronauts can see each other because light, like radio waves, can travel through vacuum.

66) Sonar scanners are used by doctors. Explain.

Ans: sonar scanners send out ultrasonic waves, which are reflected by body tissue and organs. From the pattern of reflections, a computer can build up an image of the internal structure which is vital for diagnosis.

67) Why the flash of lightning is seen before the sound of thunder is heard?

Ans: the velocity of light is much greater than that of the sound. Therefore, flash of lightning is seen before the sound of thunder is heard.

68) Bats have poor eyesight but are able to home their prey with great accuracy. Also, dolphins can avoid fishing nets and can detect fish at night. Explain

Ans: Bats emit high frequency (1, 20,000 Hz) sound waves and listen with their sensitive ears for any echoes. From the time taken to hear the echo and from the nature of sound received. Bats are able to estimate the distance and the type of surroundings. This process is known as echolocation. Same process is used by the dolphins.

69) When low flying aircraft passes overhead, we sometimes notice a slight disturbance on our TV screen. Why is it so?

Ans: a low flying aircraft reflects TV signal. Due to the interference between the direct signal and the reflected signal, there is disturbance on the TV screen.

70) In automobiles, why are convex mirrors used to see the traffic from behind?

Ans: Convex mirrors are used in automobiles because they form erect and diminished images of the object. Thus, it helps the drivers to get a wider field of view of the traffic coming from behind.

71) Why is mirage forms in the deserts?

Ans: A mirage is formed owing to total internal reflection. To the observer at a distance, the reflected image of the object appears behind the reflecting surface, as if the object were in front of it, but actually it is just an illusion.

72) What will be the colour of grass in blue light?

Ans: Grass will appear blackish in colour in blue light because it has the property of absorbing all other colours except its own colour. The blue rays falling on grass will be absorbed by it, and it will appear dark coloured.

73) A bird perches on a bare high power line and nothing happens to it. A man standing on the ground touches the same line and gets a fatal shock. Why?

Ans: When bird perches on a live high power line, no current passes through the body of bird because there is no potential difference between live wire and the body of bird as the potential of bird's body is the same as that of wire. When a man standing on the ground touches the same wire then due to a large potential difference between his hands and feet, a large current flows through his body to the earth.

74) During lightning it is safest to be inside a car rather than under a tree or in the open. Give reason.

Ans: When a person is in the open or under the tree, the lightning passes through his body to the earth. On the other hand, for a person inside a car, the car provides shielding and the electric field inside the car is zero, thus lightning does not affect the person inside it. The lightning actually passes through the metallic body of the car to the earth without affecting the person sitting inside it.

75) Why is earthing desirable for electric appliances?

Ans: Earthing helps the current move into the earth in the event of short-circuit, without giving a shock to the user.

76) Why does a perspiring man feel relief when air flows by his side?

Ans: The air flowing by the side of a perspiring man quickens the pace of evaporation of perspiration from the body of that person, and the resultant loss of heat from his body causes the cooling sensation which provides relief to him.

77) Why is magnet always made of soft iron?

Ans: Magnet is always made of soft iron because 'magnetization' and 'demagnetization' both are possible in soft iron.

78) Why are telephone wires between two poles kept loose?

Ans: Telephone wires are kept loose between two poles so that they are protected from being broken due to expansion and contraction caused by the change of temperature in summers and winters.

79) X-rays penetrate through the flesh but not through bones. Why?

Ans: The penetrating power of X-rays depends upon the potential difference between the cathode and the anode of X-ray tube. The X-rays produced can penetrate through light element like flesh of human body but they are unable to penetrate through heavier elements like bones.

80) What is a black hole? Why is it called so?

Ans: A black hole is a super dense planetary material formed due to the death of a star of mass more than five solar masses. It is called black hole because any particle or photon approaching its surface is just swallowed by it. It appears black, as radiation is neither emitted nor reflected by it.

81) Why do water pipes burst in severe cold winters?

Ans: Water freezes in pipes during winters, when the temperature goes below 0 degree Celsius (i.e., freezing point of water). It expands and in the process exerts pressure on the water pipes, thereby sometimes bursting them.

82) Most aircrafts and ships have their front shape pointed. Why?

Ans: The shape of many objects, viz. aeroplanes, rockets, ships, etc. moving through air or water, is designed in such a way that friction can be reduced between the objects and air/water. Such type of body is known as streamlined and the process is known as streamlining.

83) An athlete runs some distance before taking jump, why?

Ans: An athlete runs a certain distance before actually jumping in order to increase his speed, and thereby, his inertia of motion. This increased inertia of motion enables him to jump a longer distance.

84) It is difficult to drown in the Dead Sea. Why?

Ans: The water of Dead Sea has a salt content of 27%. Therefore, its density is much greater than that of ordinary sea water and it also offers a greater upthrust. Hence, the body weighs less than an equal volume of Dead Sea water and is thus, able to float.

85) Why aquatic animals have soft skeleton unlike those of the terrestrial animals?

Ans: The density of animals and fish living in water is almost the same as the density of water. Therefore, their weight is almost completely balanced by buoyancy. That is why they do not need massive skeleton like those of terrestrial animals.

86) Why does a swimming pool appear less deep than it really is?

Ans: When rays of light start from the bottom of a pool and travel from water to air, they are refracted away from the normal because they travel from a denser medium to a rarer medium. As a result, a virtual image of bottom is formed above the bottom. Hence, a swimming pool appears less deep than it really is.

87) Why is electrical wiring in parallel better?

Ans: electrical wiring in parallel is better because all the lines will have the same potential difference and if one line gets fused the other lines remain unaffected.

88) It is easier to swim in sea water than in river water. Explain.

Ans: The density of sea water is more than that of the river water. Therefore, the weight of sea water displaced by the swimmer is more. Thus, buoyant force of up thrust on the swimmer increases, making it easier to swim in sea water.

89) A cold compress is applied on the forehead of a person suffering from high fever. Why?

Ans: Evaporation causes cooling. As the water evaporates, it absorbs heat from the forehead and helps in reducing the temperature.

90) A man with a load on his head jumps from a high building. What will be the load experienced by him.

Ans: Zero, because the acceleration of his fall is equal to the acceleration due to gravity of the earth.

91) Why is spring made of steel and not copper?

Ans: The elasticity of steel is greater than that of copper.

92) Why is it easier to spray water to which soap is added?

Ans: Addition of soap decreases the surface tension of water. The energy for spray is directly proportional to surface tension.

93) A piece of chalk when immersed in water, emits bubbles. Why?

Ans: Chalk consists of pores forming capillaries. When it is immersed in water, the water begins to rise in the capillaries and air present there is expelled in the form of bubbles.

94) Why does a liquid remain hot or cold for a long time inside a thermo flask?

Ans: Because of the presence of air, which is poor conductor of heat, in between the double glass walls of a thermos flask?

95) Why is the boiling point of sea water more than that of pure water?

Ans: Sea water contains salts and other impurities with different points which jointly rise its boiling point.

96) Why is it recommended to add salt in water while boiling grams?

Ans: By addition of salt the boiling point of water gets which helps in cooking.

97) Why is soft iron used as an electromagnet?

Ans: Because it remains magnetic only till the current passes through the coil and loses its magnetism when the current is switched off (principle of electric bells)

98) Why does ink leak out of a partially filled pen when taken to a high altitude?

Ans: As we go up the pressure and the density of air go on decreasing. Partially filled pen leaks when taken to a higher altitude because the pressure of air acting on the ink inside the tube of the pen is greater than the pressure of air outside.

99) Why does some liquids burn while others do not?

Ans: A liquid burns if its molecules can combine with oxygen of the air with the production of heat. Hence, oil burns but water does not.

100) Oil and water do not mix. Why?

Ans: i) Molecules of oil are not bigger than that of water and therefore do not mix easily. ii) Molecules of water are polar, i.e. they have opposite charges at two ends whereas oil molecules do not; as a consequence they tend to stay away from water molecule.