

8th Science Lesson 2 Questions in English

2] Forces And Pressure

1. Which of the following actions needs force?

- 1) Opening up a pen
 - 2) Striking a carrom coin
 - 3) Making of chapattis
- a) 1, 2
 - b) 1, 3
 - c) 2, 3
 - d) All the above

Explanation

Opening up a pen, opening a door, kicking a football, **striking a carrom coin**, **making of chapattis** etc., all these actions need a force.

2. Assertion(A): Force changes the shape and size of certain bodies

Reason(R): Force is an 'action of push or pull', which makes the bodies to move or brings the moving bodies to rest

- a) Both (A) and (R) are correct, but (R) does not explain (A)
- b) Both (A) and (R) are wrong
- c) Both (A) and (R) are correct and (R) explains (A)
- d) (A) is Correct and (R) is wrong

Explanation

Force is an 'action of push or pull', which makes the bodies to move or brings the moving bodies to rest. It even **changes the shape and size** of certain bodies.

3. Assertion(A): The group of students who pull the rope with a greater force will definitely win

Reason(R): The winners are applying a greater amount of force.

- a) Both (A) and (R) are correct, but (R) does not explain (A)
- b) Both (A) and (R) are wrong
- c) Both (A) and (R) are correct and (R) explains (A)
- d) (A) is Correct and (R) is wrong

Explanation

The group of students who pull the rope with a **greater force will definitely win**. The winners are **applying a greater amount of force**. Hence, the rope moves in the direction of the greater force.

4. Which of the following can be done by force?

- 1) State of rest
- 2) Shape of a body
- 3) Direction of a moving body
 - a) 1, 2
 - b) 1, 3
 - c) 2, 3
 - d) **All the above**

Explanation

Force is that which changes or tends to change: i) the **state of rest** or ii) the **state of uniform motion of a body** or iii) the **direction of a moving body** or iv) the **shape of a body**

5. Which of the following statement about force is correct?

- 1) It has only direction.
- 2) Force is a vector quantity
- 3) It is measured with a unit called "newton (N)"
 - a) 1, 2
 - b) 1, 3
 - c) **2, 3**
 - d) All the above

Explanation

Pushes and pulls are forms of forces. The direction of a force is in the direction in which a push or a pull is applied. Thus, force is a **vector quantity**, which **has magnitude and direction**. It is measured with a **unit called "newton (N)"**.

6. Assertion(A): A Balloon placed over a number of needles will not burst

Reason(R): When a large number of pins prick a body, each pin exerts very little pressure on the balloon

- a) Both (A) and (R) are correct, but (R) does not explain (A)
- b) Both (A) and (R) are wrong
- c) **Both (A) and (R) are correct and (R) explains (A)**

d) (A) is Correct and (R) is wrong

Explanation

A single pin produces a large pressure over a small area. But, when a large number of pins prick a body, each pin exerts very little pressure on the balloon, as the applied force gets distributed over a larger surface of the body. So, the balloon will not burst. We conclude that the effect of a force depends on the magnitude of the force and the area over which it acts.

7. In which unit thrust is measured?

- a) N/m
- b) N/s
- c) **N**
- d) m/s

Explanation

Thrust is a force acting perpendicularly on any given surface area of a body. It is measured by the unit newton.

8. Which of the following statement is correct?

- 1) The effect of force can be measured using a physical quantity called pressure.
 - 2) It can be defined as the amount of force or thrust acting perpendicularly on a surface of area one square meter of a body
- a) 1 alone
 - b) 2 alone
 - c) **1, 2**
 - d) None

Explanation

The **effect of force** can be measured using a **physical quantity** called **pressure**. It can be defined as the amount of force or **thrust acting perpendicularly on a surface of area one square meter of a body**.

9. Unit of pressure is_____

- 1) N
 - 2) N/m^2
 - 3) Pa
- a) 1, 2
 - b) 1, 3
 - c) **2, 3**
 - d) All the above

Explanation

Unit of pressure is pascal (Pa) or N m^{-2} .

Pressure = Thrust (or) Force/ Area

The SI unit of pressure is pascal (named after the French scientist Blaise Pascal).

1 pascal = 1 N m^{-2}

10. Calculate the pressure. Average weight of an elephant is 4000 N. Surface area of the sole of its foot is 0.1 m^2 .

- a) 10^4
- b) 10^2
- c) 10^3
- d) 10^{10}

Explanation

Average weight of the elephant = 4000 N

Weight of one leg = force exerted by one leg = $4000/4 = 1000 \text{ N}$

Area of the sole of one foot = 0.1 m^2

Pressure = Force/ Area = $1000/ 0.1$

$$= 10^4 \text{ N m}^{-2}$$

11. The effect of pressure can be increased by_____

- a) Increasing the thrust
- b) Decreasing the thrust
- c) Decreasing the area of the surface of the body
- d) Both a and c

Explanation

The effect of pressure can be increased by increasing the thrust or by decreasing the area of the surface of the body experiencing the thrust.

12. Assertion(A): Camels can walk easily on sand

Reason(R): They have large padded feet, which increase the area of contact with the sandy ground

- a) Both (A) and (R) are correct, but (R) does not explain (A)

- b) Both (A) and (R) are wrong
- c) Both (A) and (R) are correct and (R) explains (A)
- d) (A) is Correct and (R) is wrong

Explanation

It is **very difficult to walk on sand**. But **camels can walk easily on it because they have large padded feet, which increase the area of contact with the sandy ground**. This reduces the pressure and enables them to walk easily on the sand.

13. Which of the following have sharp fine edges so as to exert a larger pressure on a smaller area?

- 1) Axe
 - 2) Nail
 - 3) Bullet
- a) 1, 2
 - b) 1, 3
 - c) 2, 3
 - d) All the above

Explanation

The **axe, nail, knife, injection needle, bullet** etc., all these are having **sharp fine edges** so as to exert **a larger pressure on a smaller area of the body**; in order to get the maximum effect from them.

14. Which of the following statement relating to pressure is correct?

- 1) More number of wheels are provided for a heavy goods-carrier for decreasing the pressure
 - 2) Broader straps are provided on a backpack for giving a lower pressure on the shoulders by providing a larger area of contact with the shoulder.
 - 3) It is difficult to drive an automobile, which has flattened tyres
- a) 1, 2
 - b) 1, 3
 - c) 2, 3
 - d) All the above

Explanation

- More number of wheels are provided for a heavy goods-carrier for decreasing the pressure; thereby increasing the area of contact on the road.
- Broader straps are provided on a backpack for giving a lower pressure on the shoulders by providing a larger area of contact with the shoulder.
- It is difficult to drive an automobile, which has flattened tyres.

15. Which of the following statement is incorrect?

- 1) All objects on the surface of the Earth experience the thrust or force due to this atmosphere
- 2) Air that fills the space all around us, is called as atmosphere
 - a) 1 alone
 - b) 2 alone
 - c) 1, 2
 - d) **None**

Explanation

You all know very well that air fills the space all around us. This **envelope of air is called as atmosphere**. It extends up-to many kilometres above the surface of the Earth. **All objects on the surface of the Earth experience the thrust or force due to this atmosphere.**

16. The barometer was invented by_____

- a) Newton
- b) **Torricelli**
- c) Barren
- d) Einstein

Explanation

Atmospheric pressure can be measured using the device called barometer. **The barometer was invented by "Torricelli"**

17. Atmospheric pressure_____ with altitude from the surface of the Earth

- a) Increases
- b) **Decreases**
- c) Initially increase then decreases
- d) None

Explanation

The amount of force or weight of the atmospheric air that acts downward on unit surface area of the surface of the Earth is known as atmospheric pressure. **Atmospheric pressure decreases with altitude from the surface of the Earth.**

18. Which of the following statement is correct?

- 1) Atmospheric pressure can be measured by the height of the mercury column in a barometer.
- 2) The height of the mercury column denotes the atmospheric pressure at that place at a given time in 'millimetre of mercury'.

- 3) Even if you tilt the tube at various angles, you will see that the level of mercury will not vary
- a) 1, 2
 - b) 1, 3
 - c) 2, 3
 - d) All the above

Explanation

Atmospheric pressure can be measured by the height of the mercury column in a barometer. The height of the mercury column denotes the atmospheric pressure at that place at a given time in 'millimetre of mercury'. Even if you **tilt the tube at various angles, you will see that the level of mercury will not vary**

19. At sea level, the height of the mercury column is around_____

- a) 76 cm
- b) 760 cm
- c) 76 mm
- d) 760 m

Explanation

At sea level, the height of the mercury column is around 76 cm or 760 mm. The pressure exerted by this mercury column is considered as the pressure of magnitude 'one atmosphere' (1 atm).

20. Assertion(A): Cooking is difficult at higher altitude

Reason(R): At a higher altitude, due to the lack of atmospheric pressure the boiling point of a substance reduces

- a) Both (A) and (R) are correct, but (R) does not explain (A)
- b) Both (A) and (R) are wrong
- c) Both (A) and (R) are correct and (R) explains (A)
- d) (A) is Correct and (R) is wrong

Explanation

At a higher altitude, due to the lack of atmospheric pressure the boiling point of a substance reduces. So, the water boils even at 80° C. At this temperature, the thermal energy that is produced is not sufficient enough for baking or cooking. So, **cooking is difficult at higher altitude.**

21. The upward force exerted by water on a floating or a partly submerged body is called as_____

- a) Newtons force

- b) Galileo force
- c) **Buoyant force**
- d) None

Explanation

An upward force is exerted by water on a floating or a partly submerged body. This upward force is called buoyant force. The phenomenon is known as "buoyancy".

22. Which of the following is/are called as fluids?

- a) Gas
- b) Solid
- c) Liquid
- d) **Both 1 and 2**

Explanation

Buoyant force is not only exerted by liquids, but also by gases. **Liquids and gases together are called fluids.**

23. Which of the following statement is correct?

- 1) Buoyant upward force decides whether an object will sink or float
- 2) A body floats if the buoyant force $>$ its weight
- 3) A body sinks if its weight $>$ buoyant force.
 - a) 1 alone
 - b) 2, 3
 - c) 1, 3
 - d) **All the above**

Explanation

Buoyant upward force decides whether an object will sink or float. If the weight of the object is less than the upward force, then the object will float. If not, it will sink. A body **floats** if the buoyant **force $>$ its weight**; A body **sinks** if its **weight $>$ buoyant force**.

24. Which of the following statement is correct?

- 1) Liquids do not have a definite shape.
- 2) Liquids exert a pressure not only on the base of their container/vessel, but also on its side walls.
- 3) The pressure exerted by a liquid depends upon the depth of the point of observation considered in it.
 - a) 1, 2
 - b) 1, 3

- c) 2, 3
- d) **All the above**

Explanation

Liquids do not have a definite shape. The force acting on unit area of the surface, on which the liquid is placed, is called the static pressure of the liquid. **Liquids exert a pressure not only on the base of their container/vessel, but also on its side walls.** The pressure exerted by a liquid depends upon the depth of the point of observation considered in it.

25. An instrument used to measure the difference in the liquid pressure is called_____

- a) Altimeter
- b) **Manometer**
- c) Fathometer
- d) Barometer

Explanation

An instrument used to measure the difference in the liquid pressure is called a “manometer”. You can measure the pressure of fluids enclosed in a definite container using the manometer.

26. Which of the following statement is correct?

- 1) Liquids exert the same pressure in all directions at a given depth
 - 2) Liquid pressure varies with the depth
 - 3) Pressure exerted by a liquid on the base of a container depends upon the height of the liquid column
- a) 1, 2
 - b) 1, 3
 - c) 2, 3
 - d) **All the above**

Explanation

Pressure exerted by a liquid on the base of a container depends upon the height of the liquid column. Liquids exert the same pressure in all directions at a given depth. Liquid pressure varies with the depth.

27. Assertion(A): When hole is made in a bottle, water comes out from all the holes with the same force and falls on the ground, at the same distance from the bottle

Reason(R): Liquids exert the same pressure in all directions, at a given depth in their container

- a) Both (A) and (R) are correct, but (R) does not explain (A)

- b) Both (A) and (R) are wrong
- c) **Both (A) and (R) are correct and (R) explains (A)**
- d) (A) is Correct and (R) is wrong

Explanation

Take a plastic bottle. Punch three holes on its sides at the same height from its base. Now, pour some water into it and let it flow through the holes. Observe the flow of the water.

Inference: The water comes out from all the holes with the same force and falls on the ground/table, at the same distance from the bottle.



Reason: This activity confirms that liquids exert the same pressure in all directions, at a given depth in their container.

28. Which law deals with the pressure applied at any point of a liquid at rest?

- a) Newton's 2nd law motion
- b) **Pascal's law**
- c) Buoyant law
- d) Newton's 3rd law

Explanation

Pascal's law: The pressure applied at any point of a liquid at rest, in a closed system, will be distributed equally through all regions of the liquid.

29. Which of the following is not an application of Pascal's law?

- a) Hydraulic lift
- b) Automobile brake system
- c) Hydraulic press
- d) **Fire engine**

Explanation

Some of the following examples highlight their working according to Pascal's law

- In an automobile service station, the vehicles are lifted upward using the **hydraulic lift**, which works as per Pascal's law.
- The **automobile brake system** works according to Pascal's law.
- The **hydraulic press** is used to make the compressed bundles of cotton or cloth so as to occupy less space.

30. Assertion(A): If one piston is pressed downward, then the other piston will move up slightly, depending on the pressure given on the first piston

Reason(R): The pressure exerted on a liquid at rest is transmitted equally to other portions of liquid.

- a) Both (A) and (R) are correct, but (R) does not explain (A)
- b) Both (A) and (R) are wrong
- c) Both (A) and (R) are correct and (R) explains (A)
- d) (A) is Correct and (R) is wrong

Explanation

Fill two identical syringes with water. Connect them with a plastic tube. Press gently on one end of a piston. What do you observe?

Inference: If one piston is pressed downward, then the other piston will move up slightly, depending on the pressure given on the first piston.

Reason: This activity confirms that the pressure exerted on a liquid at rest is transmitted equally to other portions of the liquid.



31. Why are rain drops spherical in nature?

- a) Force
- b) Pressure
- c) **Surface tension**
- d) All the above

Explanation

Why are rain drops spherical in nature?

All the above questions have an answer, i.e., "**due to surface tension**".

32. Which of the following statement is correct?

- 1) Surface tension is the property of a liquid
 - 2) The molecules of a liquid experience a force, which contracts the extent of their surface area as much as possible, so as to have the minimum value
- a) 1 alone
 - b) 2 alone
 - c) **1, 2**
 - d) None

Explanation

Surface tension is the property of a liquid. The molecules of a liquid experience a force, which contracts the extent of their surface area as much as possible, so as to have the minimum value.

33. What is the unit of Surface tension?

- a) N
- b) N/s
- c) Nm
- d) **N/m**

Explanation

The amount of force acting per unit length, on the surface of a liquid is called surface tension. Surface tension has the **unit N m^{-1}** .

34. _____ tissues carry Water in plants

- a) **Xylem**
- b) Phloem
- c) Both a and b
- d) none

Explanation

Water molecules rise up due to surface tension. **Xylem tissues** are very narrow vessels present in plants. **Water molecules** are absorbed by the roots and these vessels help the water to rise upward due to “**capillarity action**”, which is caused by the surface tension of water.

35. For a given volume, the surface area of a sphere is_____

- a) **Minimum**
- b) Maximum
- c) Either a or b
- d) None

Explanation

For a given volume, the surface area of a sphere is the minimum. This is the Reason for the liquid drops to acquire a spherical shape.

36. Water strider insect slides on the water surface easily due to_____

- a) Pressure
- b) **Surface tension**
- c) Force
- d) Viscous force

Explanation

Water strider insect slides on the water surface easily due to the **surface tension of water**. For a given volume, the surface area of a sphere is the minimum. This is the Reason for the liquid drops to acquire a spherical shape.

37. Which of the following statement is correct?

- 1) When a liquid is flowing, there is a frictional force between the successive layers of the liquid.
 - 2) This force which acts in order to oppose the relative motion of the layer is known as viscous force
- a) 1 alone
 - b) 2 alone
 - c) **1, 2**
 - d) None

Explanation

When a liquid is flowing, there is a frictional force between the successive layers of the liquid. This force which acts in order to oppose the relative motion of the layer is known as **viscous force**. Such a property of a liquid is called **viscosity**.

38. What is the unit of Viscosity?

- a) N/m
- b) **N s m^{-2}**
- c) N/s
- d) Nm/s

Explanation

Viscosity force is measured by the unit called poise in CGS and $\text{kg m}^{-1} \text{s}^{-1}$ or **N s m^{-2}** in SI. When a liquid is flowing, there is a frictional force between the successive layers of the liquid. This force which acts in order to oppose the relative motion of the layer is known as viscous force.

39. Which of the following is/are contact force?

- a) Magnetic force
- b) Electric force
- c) **Frictional force**
- d) Both a and b

Explanation

You have studied that forces are classified into two types: contact force and non-contact force. Now, you are going to study one of the **contact forces, i.e., friction**.

40. Which of the following statement is correct?

- 1) Frictional force or friction arises when two or more bodies in contact move or tend to move, relative to each other.
 - 2) This force is produced due to the geometrical similarities of the surface of the bodies, which are in relative motion
- a) **1 alone**
 - b) 2 alone
 - c) 1, 2
 - d) None

Explanation

Frictional force or friction arises when two or more bodies in contact move or tend to move, relative to each other. It acts always in the opposite direction of the moving body. This force is produced due to the **geometrical dissimilarities** of the surface of the bodies, which are in relative motion.

41. Which of the following causes friction?

- 1) Friction increases motion
- 2) Friction produces heat

3) Friction causes wear and tear of the surfaces

- a) 1, 2
- b) 1, 3
- c) 2, 3
- d) All the above

Explanation

Friction can produce the following effects:

- Friction **opposes motion**.
- Friction causes wear and tear of the surfaces in contact.
- Friction produces heat.

42. The friction experienced by the bodies, which are at rest is called_____

- a) **Static friction**
- b) Kinetic friction
- c) Sliding friction
- d) Rolling friction

Explanation

Static friction: The **friction experienced by the bodies, which are at rest is called static friction**. (E.g.: all the objects rigidly placed to be at rest on the Earth, a knot in a thread.)

43. Which of the following are the examples of rolling friction?

- 1) Trolleys
 - 2) Suitcases
 - 3) Vehicles
- a) 1, 2
 - b) 1, 3
 - c) 2, 3
 - d) **All the above**

Explanation

When a body rolls over another surface, the friction acting between the surfaces in contact is called rolling friction. **Rolling friction** is less than sliding friction. That is why wheels are provided in **vehicles, trolleys, suitcases** etc.

44. Assertion(A): The marble covers a lesser distance over the cotton cloth in comparison with the distance it covers over the glass plate

Reason(R): A rough surface like the cotton cloth, offers more frictional force

- a) Both (A) and (R) are correct, but (R) does not explain (A)
- b) Both (A) and (R) are wrong
- c) **Both (A) and (R) are correct and (R) explains (A)**
- d) (A) is Correct and (R) is wrong

Explanation

Inference: The marble covers a lesser distance over the cotton cloth in comparison with the distance it covers over the glass plate.

Reason: A rough surface like the cotton cloth, offers more frictional force. So, the marble moves slowly and covers a minimum distance. The smooth surface of glass, offers lesser friction. So, the glass marble travels a greater distance over it.

The above activity reveals the 'effect of the force of friction', which increases as the roughness of the surface increases.

It is easy to walk or ride a vehicle on a road, but it is difficult to do the same on sand due to its greater friction (roughness).

45. Assertion(A): It is easy to drive a cycle with load

Reason(R): Weight does not affect the friction

- a) Both (A) and (R) are correct, but (R) does not explain (A)
- b) Both (A) and (R) are wrong
- c) Both (A) and (R) are correct and (R) explains (A)
- d) **Both (A) and (R) is wrong**

Explanation

It is easy to pedal your cycle without any load on its carrier. With a load placed on its carrier, it is difficult to move it because the **weight on the carrier increases the friction** between the surface of the tyre and the road.

46. Assertion(A): A road roller has a broad base, so it offers more friction on the road.

Reason(R): If the area of contact is greater, then, the friction will be greater too.

- a) Both (A) and (R) are correct, but (R) does not explain (A)
- b) Both (A) and (R) are wrong
- c) **Both (A) and (R) are correct and (R) explains (A)**
- d) (A) is Correct and (R) is wrong

Explanation

For a given weight, the friction is directly related to the area of contact between the two surfaces. If the **area of contact is greater, then, the friction will be greater too**. A road roller has a broad base, **so it offers more friction on the road**. But a cycle has the least friction, since the area of contact of the tyre with the surface of the road is less.

47. Which of the following are related to friction?

- a) We can hold any object in our hand due to friction.
- b) The footwear and the ground help us to walk without slipping
- c) Writing easily with a pen on paper is due to friction
- d) **All the above**

Explanation

- We can hold any object in our hand due to friction.
- We can walk on the road because of friction. The footwear and the ground help us to walk without slipping.
- Writing easily with a pen on paper is due to friction.
- Automobiles can move safely due to friction between the tyres and the road. Brakes can be applied due to frictional resistance on brake shoes.

48. Which of the following are disadvantages of friction?

- 1) Friction wears out the surfaces rubbing with each other, like screws and gears in machines or soles of shoes
 - 2) Leads to wastage of energy.
 - 3) Friction produces heat, which causes physical damage to the machines
- a) 1, 2
 - b) 1, 3
 - c) 2, 3
 - d) **All the above**

Explanation

- Friction wears out the **surfaces rubbing with each other, like screws and gears in machines** or soles of shoes.

- To overcome the friction an excess amount of effort has to be given to operate a machine. This **leads to wastage of energy**.
- **Friction produces heat**, which causes physical damage to the machines

49. Which of the following decrease friction?

- 1) Grease
 - 2) Graphite
 - 3) Coconut oil
- a) 1, 2
 - b) 1, 3
 - c) 2, 3
 - d) All the above

Explanation

A substance, which reduces the frictional force, is called a **lubricant**. E.g.: **grease, coconut oil, graphite, castor oil**, etc.

50. Which of the following can be replaced in the place of sliding friction in cycle?

- a) **Rolling**
- b) Static
- c) Both a and b
- d) None

Explanation

Since, the rolling friction is smaller than sliding friction, **sliding is replaced by rolling** with the usage of ball bearings. You can see lead shots in the bearing of a cycle hub.