Force and Pressure

1. Which of the following actions describe pushing force?
(a) Kicking
(b) Lifting
(c) Picking
(d) Opening

2. Which of the following is NOT a force?
(a) Muscular
(b) Magnetic
(c) Chemical
(d) Electric

3. A force is applied on an object in the direction of its motion. What is the effect of force on the object?
(a) The speed of the object will increase.
(b) The speed of the object will decrease.
(c) The speed of the object will remain unchanged.
(d) The object comes to rest.

4. If no force acts on a body at rest, then what effect can be observed?
(a) The body changes shape.
(b) The body moves with increased speed.
(c) The body remains at rest.
(d) The body breaks up.

5. Which of the following examples describe the change of shape on applying force?
(a) A ball being kicked
(b) A fan switched on
(c) A man jumping from a height
(d) Repeatedly tearing of a paper

6. Which of the following effects is caused by frictional force?
(a) Change in the shape of an object
(b) Change in the direction of the motion of an object
(c) Slowing down of a moving object
(d) Acceleration in a moving body

7. Which of the following is a non-contact force?
(a) Muscular force
(b) Electrostatic force
(c) Elastic spring force
(d) Frictional force

8. What causes the atmospheric pressure?
(a) The sky above our head
(b) The air surrounding the earth
(c) The gravitational force of the sun and other planets
(d) The mass of the earth

9. How does the pressure exerted by a liquid change?
(a) Increases with depth
(b) Decreases with depth
(c) Remains constant
(d) First increases and then decreases

10. What is thrust equal to?
(a) Force × area
(b) Force/area
(c) Pressure
(d) Pressure × area

11. A When does a body float on water?
(a) When no force is acting on it.
(b) When the net force acting on the body is zero
(c) When there is a gravitational pull.
(d) When there is friction between the body and the water

12. In which of the following cases the net force is NOT equal to zero?
(a) A kite held stationary in the sky.
(b) A ball falling freely from a height.
(c) A helicopter hovering above the ground.
(d) A cork floating on the surface of water.

13. We use a straw (narrow pipe) to drink juice from a glass. What make this possible?
(a) The volume of liquid
(b) The atmospheric pressure
(c) The gravitational pull
(d) All of the above

14. Which of the following effects is NOT caused by the magnetic force between a magnet and a magnetic substance?
(a) Change of state
(b) Change of shape
(c) Change of size
(d) Change of chemical composition

15. In cities, water from an overhead tank is supplied to houses using the principle of.
(i) difference in pressure.
(ii) gravitational force.
(iii) decrease of friction m pipes.
(a) Only (i)
(b) Only (i) and (ii)
(c) Only (ii) and (iii)
(d) (i), (ii) and (iii)

16. A deep sea diver's ears get hurt when he is inside the water. What is the cause for it?
(a) Lack of oxygen
(b) Decrease in atmospheric pressure
(c) Increase in water pressure
(d) All of the above

17. What does a barometer measure?
(a) Liquid pressure
(b) Thrust
(c) Atmospheric pressure
(d) Air temperature

18. Four forces are acting on a body. If the body does not change its position or shape/then what does it mean?
(a) Forces are similar acting in the same direction.
(b) Forces are parallel and opposite.
(c) Forces add up to zero when taken as vectors.
(d) Forces are different acting in the same direction.

19. Why do deep sea divers use a special suit for diving?
(a) To maintain their body temperature in cold sea water
(b) To protect against sea animals
(c) To counter balance the pressure in the sea.
(d) To keep them dry

20. On what factors does the magnitude of non-contact force depend?
(a) Distance between two bodies
(b) Mass of the two bodies
(c) Chemical composition of the two bodies
(d) All of the above

21. Why does a rubber sucker stick to a surface?
(a) It is the inherent property of rubber.
(b) Gravitational force acts on it.
(c) Elastic spring force acts on it.
(d) Atmospheric pressure acts on it.

22. Which force does an archer use to pull a bow?
(a) Muscular force
(b) Magnetic force
(c) Gravitational force
(d) All of the above

23. A player slides a bowling ball on the lane to hit the pins. What is the effect of the force exerted on the bowling ball?
(a) Stops the moving bowling ball
(b) Changes the direction of the moving bowling ball
(c) Changes the shape of the moving bowling ball
(d) Changes the position of the stationary pins

24. Which of the following requires a pushing force?
(a) Throwing a stone
(b) Grabbing hold of a pencil
(c) Leaves falling from a tree
(d) A load lifted by a pulley

25. Identify the application of low pressure in everyday life.
(a) Wide tyres of a heavy vehicle
(b) Cutting of an apple with a sharp knife
(c) Hammering of a nail into wood
(d) All of the above

26. Which of the following does NOT require a force?
(a) Rowing of a boat
(b) Bursting of a balloon filled with lots of air.
(c) Pedalling a cycle
(d) Catching a moving cricket ball

27. Which of the following is true of the man in the picture shown below?

(a) He is applying force on the stool.
(b) He represents only magnitude but no direction.
(c) He is not applying any force on the stool.
(d) The gravitational pull of earth on the stool is greater.

28. Which of the following statements about the moon is NOT correct?
(a) The moon orbits the earth keeping the same side facing us.
(b) The gravitational pull of the moon causes high tides in oceans.
(c) The craters on the moon caused long ago still exist because the moon has no atmosphere.
(d) The sun lights up the complete moon at any one time.

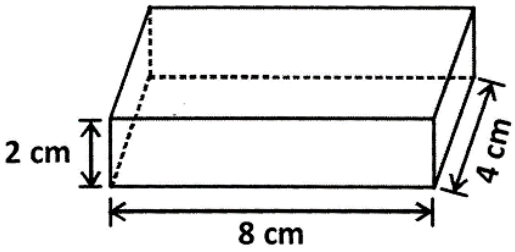
29. A book remains at rest on a table. Why?
(a) No force acts on it.
(b) There is friction between the book and the surface of the table.
(c) Force exerted by the book on the table is the same as the force exerted by the table on the book.
(d) All of the above

30. How is the weight of an astronaut in the outer space in relation with his actual weight?
(a) It is less than his actual weight.
(b) It is more than his actual weight.
(c) It is the same as his actual weight.
(d) It is zero.

31. Why is the atmospheric pressure not felt by us?
(a) It is small in magnitude.
(b) It acts only-on atmosphere and not on us.
(c) Our internal body pressure is equal to that of the atmospheric pressure.
(d) It does not act at sea level.

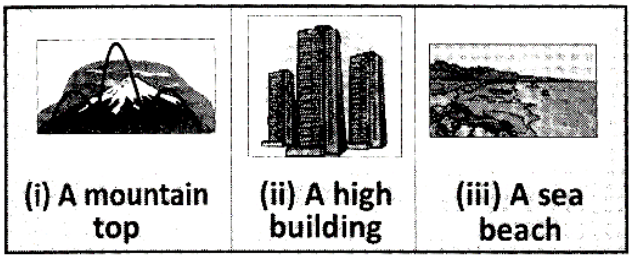
32. The speed of a falling body increases continuously. Why?
(a) No force acts on the falling body.
(b) The falling body is very light.
(c) Air exerts a frictional force on the falling body.
(d) The force acting on the body is in the direction of the fall.

33. Look at the block placed on the table given below:



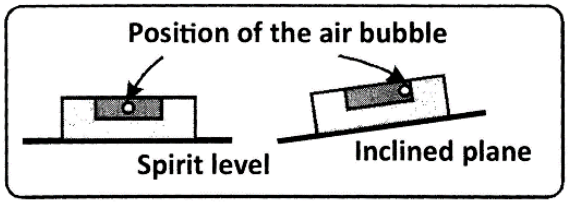
Which of the following physical quantities is not the same when this block is kept over a table with its different faces touching the table?
(a) Pressure
(b) Volume
(c) Weight
(d) Mass

34. Arrange the given pictures in ascending Br order according to the air pressure at the highest point in each case.



(a) (i), (ii), (iii)
(b) (ii), (iii), (i)
(c) (ii), (i), (iii)
(d) (iii), (ii),(i)

35. A spirit level is used to determine the surface level as shown in the figure below. Position of the air bubble



Why does the air bubble at the centre of the tube move to the right when the surface is inclined?
(a) The forces acting on the air bubble are in equilibrium.
(b) Unbalanced forces act on the air bubble.
(c) Air bubbles always rise.
(d) Frictional force act on the air bubble.

Answer With Solution

1. (a) Kicking is a pushing action while the others are pulling actions.

2. (c) Chemical energy is not a force.

3. (a) Since, the force is applied in the direction of motion of the object, the speed of the object will increase.

4. (c) In the absence of a force, a body will remain at rest (static object) or move with uniform velocity.

5. (d) We apply certain force to tear a paper. The shape of the paper changes after it is repeatedly torn into pieces.

6. (c) Frictional force between two surfaces tends to decrease the speed of a moving object.

7. (b) The electrostatic force is a non-contact force.

8. (b) Atmospheric pressure is caused by the weight of air molecules surrounding the earth.

9. (a) The pressure exerted by a liquid increases with depth.

10. (d) Thrust is the total force applied on a given area. It is given as the product of pressure and area.

11. (b) The weight of a body is balanced by the up thrust of water. Hence, the net force acting on a body is zero and so this helps the body float.

12. (b) When a ball is falling freely from a height, the net force is not equal to zero.

13. (b) When we suck air from pipe, atmospheric pressure pushes the liquid juice up to fill the vacuum and it comes up.

14. (d) A magnet attracts a magnetic material thereby making it move from rest. There may be a temporary change in the shape or size. But there is no change in the chemical composition.

15. (b) The water at a height flows down due to pressure and gravitational force.

16. (c) Water pressure increases with an increase in the depth of the sea which effects the diver's ears.

17. (c) The barometer is used to measure atmospheric pressure of a place.

18. (c) For a body to be in equilibrium or at rest, the vector sum of all forces must be zero.

19. (c) The suit (known as scuba suit) is pressurized to counter balance the heavy pressure in deep sea.

20. (d) The magnitude of non-contact force depends on the distance between two bodies, mass and chemical composition of the two bodies.

21. (d) When a rubber sucker is pressed on any surface, most of the air between its cup and the surface escapes out. The sucker sticks to the surface because of the atmospheric pressure which acts on it.

22. (a) An archer uses his strength (muscular force) to pull a bow.

23. (d) When a bowling ball is made to slide by the exertion of force, there will be a change in the position of the stationary pins.

24. (a) For throwing a stone, we need to apply a pushing force.

25. (a)\[\text{Pressure}\,\text{=}\,\frac{\text{Thrust}}{\text{Unit}\,\text{area}}\text{.}\]If the area of the Unit area cross section is high, then low pressure is exerted due to thrust. In the case of wide tyres of a heavy vehicle, the pressure exerted by the tyres is less on the road.

26. (b) Options (A), (C) and (D) are due to application of a force. Bursting of a balloon is due to expansion beyond the elastic limit of the balloon material.

27. (a) The weight of the man is the force applied by him on the stool.

28. (d) Statements (A), (B) and (C) are true.
The sun lights up only half of the moon (not complete moon) at any one time. This is because moon is also a sphere like the sun.

29. (c) A book remains at rest on a table. Force exerted by the book on the table, is the same as the force exerted by the table on the book.

30. (d) Since, weight is the result of gravitational force acting on an object, there is no gravitational force acting on the astronaut and so, the weight of an astronaut in outer space will be zero.

31. (c) Our internal body pressure is equal to the atmospheric pressure. Hence, we do not feel the atmospheric pressure.

32. (d) The gravitational force for a falling body is along the direction of motion. Hence, its speed increases continuously till it touches the ground.

33. (a) The given block is a cuboid. For different orientations of faces, different areas of contact exist. Hence, pressure exerted by the block is not the same in all the cases of orientation. Pressure is thrust per unit area.

34. (a) As height increases, air pressure decreases. The figures in ascending order of heights is sea beach, high building and mountain top. Hence, ascending order of air pressure is mountain top (i), high building (ii) and sea beach (iii).

35. (b) In a spirit level, the pressure of the liquid that acts on the air bubble in all directions is balanced when the surface is horizontal. When it is inclined, the pressure is unbalanced which results in the movement of the air bubble to the right side.