Chapter 7. Force And Pressure

Very Short Q&A:

Q1: Push or pull on an object is known as _____.

Ans: Force

Q2: Force has both magnitude and _____.

Ans: Direction

Q3: The strength of force is usually expressed by its _____.

Ans: Magnitude

Q4: What can bring change in state of motion of an object?

Ans: Force can bring change in state of motion of an object.

Q5: Define pressure.

Ans: Force per unit area is called pressure.

Q6: What are contact forces?

Ans: Forces which act only when there is physical contact between two interacting objects are known as contact forces.

Q7: What are non-contact forces?

Ans: Forces which can act without physical contact between objects are known as non-contact forces.

Q8: What happens when the forces are applied on an object in the same direction?

Ans: Forces applied on an object in the same direction add to one another.

Q9: Force can bring change in _____ and _____ of an object.

Ans: State of motion, shape.

Q10: Give an example of contact force.

Ans: Friction

Q11: Give two examples of non-contact forces.

Ans: Magnetic force and gravitational force.

Q12: A batsman hits a cricket ball which then rolls on the level ground. After covering a short distance the ball comes to rest. The ball stops due to_____.

Ans: Frictional force

Q13: When two forces, applied on an object, are equal and opposite, then these forces

a. **May move the object.**
b. **May stop a moving object.**
c. **May move the object and also cause a change in its shape.**
d. **Do not move the object but may cause a change in its shape.**

Ans: D

Q14: Which of the following is an example of contact force?

a. **Magnetic force**
b. **Muscular force**
c. **Electric force**
d. **Gravitational force**

Ans: B

Q15: A fruit falling from tree is an example of which type of force?

Ans: Gravitational force.

Q16: What is the unit of pressure?

Ans: Pascal.

Q17: Which force act from distance and pull iron objects?

Ans: Magnetic force.

Q18: What is SI unit of Force?

Ans: Newton

Q19: What is muscular force?

Ans: The force resulting due to the action of muscles is known as muscular force.

Q20: What is the relation between direction of force of friction and direction of motion?

Ans: Direction of force of friction is always opposite to the direction of motion.

Q21: Define electrostatic force.

Ans: The force exerted by a charged body on another charged or uncharged body is known as electrostatic force.

Q22: Electrostatic force is an example of _____.

Ans: Non-contact forces.

Q23: Water begins to flow towards the ground as soon as we open a tap. This happens due to which force?

Ans: Force of gravity.

Q24: Southpole of a magnet repels south pole of another magnet. True/false.

Ans: True

Q25: Define friction.

Ans: Friction is a force that resists the motion of an object that is in contact with another object or material.

Q26: Why the cutting edge of a knife should be as sharp as possible?

Ans: The cutting edge of a knife should as sharp to create greater pressure even for a very small applied force for quick action.

Q27: Cars and buses are able to run on roads. Which force is responsible for it?

Ans: Cars and buses are able to run on roads because of friction between the tyres and the road.

Q28: If the area over which the force acts decreases, the pressure _____.

Ans: Increases

Q29: Which force is used to separate solid pollutant particles from smoke given out from factories?

Ans: Electrostatic force.

Q30: What is the force exerted by the Earth on all the bodies on its surface known as?

Ans: Gravitational force.

Q31: Name the instrument which is used to measure liquid pressure.

Ans: Monometer

Q32: A liquid exerts pressure in _____ direction. (upward/downward/sideways/all)

Ans: All

Q33: Which type of force a person applies while pulling an object?

Ans: Muscular force.

Q34: Why muscular force is a type of contact force?

Ans: Because muscular force can be applied only when it is in contact with an object.

Q35: If the area over which the force acts decreases, the pressure increases. (true/false)

Ans: True

Short Q&A:

Q1: What is force? What is its unit?

Ans: A push or a pull on an object is called a force. It arises due to the interaction between two objects. Force has magnitude as well as direction. It may change in the state of motion of an object or it may bring about a change in the shape of an object. The unit of force is Newton.

Q2: What is change in state of motion? What brings change in state of motion?

Ans: A change in either the speed of an object, or its direction of motion, or both, is described as a change in its state of motion. Force may bring thechange in the state of motion of an object.

Q3: What is the difference between contact forces and non-contact forces?

Ans: Forces which act only when there is physical contact between two interacting objects are known as Contact forces. Example-muscular force. Whereas Forces which can act without physical contact between objects, i.e. those that can act from a distance, are called non-contact forces or field forces. Example-magnetic force.

Q4: Give two example each of the situation in which you apply force to change state of motion of an object and to change shape of an object?

Ans: A goal keeper applies force for saving a goal. By his action the goalkeeper tries to apply a force on the moving ball. This leads to change in state of motion of ball.

Force is applied to the shape of a ball of dough when it is rolled to make a chapatti.

Q5: Why is it difficult to hold a school bag having a strap made of a thin and strong string?

Ans: It is difficult to hold a school bag having a strap made of a thin and strong string because it apply the large pressure on the shoulders due to very small contact surface area .The pressure is inversely proportional to the surface area on which the force acts. Therefore pressure decreases if surface area increases.

Q6: Why Porters wear turbans when they have to carry heavy loads on their heads?

Ans: Porters wear turbans when they have to carry heavy loads on their heads, to increase the area of contact. This reduces the pressure on the head.

Q7: Force applied on an object may change its speed. How?

Ans: A force applied on an object may change its speed. If the force applied on the object is in the direction of its motion, the speed of the object increases. If the force is applied in the direction opposite to the direction of motion, then it results in a decrease in the speed of the object

Q8: Why Lorries and trucks carrying heavy loads have 8 tyres instead of four?

Ans: Lorries and trucks carrying heavy loads have 8 tyres instead of four. Also the tyres are broader because this increases the area of contact with the ground, thus reducing the pressure exerted on the ground.

Q9: Why the sucker sticks to the surface over which it is pressed?

Ans: When we press the sucker, most of the air between its cup and the surface escapes out. The sucker sticks to the surface because pressure of atmosphere acts on it. To pull the sucker off the surface, the applied force should be large enough to overcome the atmospheric pressure.

Q10: What is pressure? How is pressure related to the surface area on which it acts?

Ans: Force per unit area is called pressure. Pressure is inversely proportional to the surface area on which it acts. Smaller the area, larger the pressure on the surface for the same force.

Q11: When we stop pedalling the bicycle, it slows down and gradually stops .Why?

Ans: When we stop pedalling the bicycle, it slows down and gradually stops because of force of friction between the surface of tyres of cycle and the ground that brings moving bicycle to rest. The direction of force of friction is always opposite to the direction of motion.

Q12: What is frictional force? How it arises?

Ans: The force acting against the relative motion of surfaces in contact is called frictional force or friction. Friction is an example of contact force. Force of friction arises due to contact between surfaces.

Q13: What is magnetic force? What happens when we bring like poles of two magnets closer?

Ans: A magnet can exert force on another magnet without being in contact with it; this force is known as magnetic force. Like poles of two magnets repel each other. Unlike poles of two magnets attract each other.

Q14: What is gravitational force? Is gravity the property of earth alone?

Ans: Every object exerts a force on every other object. This force is known as gravitational force. Gravity is not a property of the earth alone. Every object in the universe whether large or small exerts gravitational force on every other object.

Q15: A rocket has been fired upwards to launch a satellite in its orbit. Name the two forces acting on the rocket just after leaving of the launching pad

Ans: The force acting on a rocket is:

- Frictional force due to air
- Force of gravity acting in downward direction.

Q16: What will be the effect of force while squeezing a piece of lemon between the fingers?

Ans: Agent exerting pressure-fingers.

Object- lemon.

Effect of force is observed- lemon juice is coming out, change in shape of lemon.

Q17: What will be the effect of force while taking out toothpaste from toothpaste tube?

Ans: Agent exerting pressure- fingers.

Object- tooth paste tube

Effect of force is observed- tooth paste is coming out, change in shape of tooth paste.

Q18: A blacksmith is hammering a hot piece of copper for making a tool, how does the force due to affect the piece of copper?

Ans: The force due to hammering changes the shape of the hot piece of copper to make tools.

Q19: What are the effects of the force while making high jump by an athlete?

Ans: Agent exerting pressure-An athlete.

Object- body

Effect of force – jumping

Q20: Differentiate between atmosphere and atmospheric pressure.

Ans: Atmosphere is the envelope of air surrounding our earth but the atmospheric pressure is the pressure exerted by this air.

Q21: Differentiate between friction and contact force.

Ans: Friction is the force responsible for changing the state of motion of objects but contact force is the forces which act only when there is physical contact between two interacting objects.

Long Q&A:

Q1: Explain contact and non-contact forces. Give two examples for each.

Ans:

- Contact forces:
  Forces which act only when there is physical contact between two interacting objects are known as Contact forces.
  Example-Muscular force: This is the force we can exert with our bodies by using our muscles, e.g.push, pull etc. Frictional force : The force acting against the relative motion of surfaces in contact is called frictional force or friction.
- Non-contact forces:
  Forces which can act without physical contact between objects, i.e. those that can act from a distance, are called non-contact forces or field forces.
  Example-magnetic force: Magnets exert forces of attraction or repulsion on other magnets
  Electrostatic force: The force exerted by a charged body on another charged or uncharged body is known as electrostatic force.

Q2:

a. **How can friction be reduced**
b. **How can it be increased? Give examples.**

Ans: Reducing Friction

- By using wheels and ball bearings.Use of wheels between surface moving over each other reduces friction. Ball bearingshave small balls of steel between steel surfaces. Because of the balls the steel surfaces can easily moves over each other.
- By making the rubbing surfaces smooth by polishing them.
- By using a suitable lubricant, like oil (for light machinery) or grease (for heavy machinery). This helps because fluid friction is less than solid friction.

- Friction due to air (air resistance) or water is reduced by using streamlined shapes inaeroplanes or ships. A streamlined shape is narrow in front and broader at the back. Birds and aquatic animals have streamlined shapes which held them in flying or swimming.

Increasing Friction

- Sand and gravel is strewn on slippery ground during the rainy season to increase friction. It is them easier to walk on the ground.
- By making the moving surfaces rough, e.g. tyres have designs and patterns with grooves on the surface to increase resistance with the road. This prevents slipping of the tyres on a wet road.
- To increase friction, spikes are provided in the soles of shoes used by players and athletes.

Q3: Do liquid and gases exert pressure on the walls of container in all direction? Give example to justify your statement.

Ans: Liquid and gases exerts pressure on the walls of container. For example-If we take a plastic bottle and drill four holes around near the bottom of bottle at the same height. After filling the water in that bottle, we observe that water comes out of the holes and falls at the same distance. This shows that liquid exerts pressure on the walls of container in all directions. Similarly, we are not able to inflate a balloon which has holes because air inside balloon exerts pressure in all direction.Hence we can say that gases exert pressure on the walls of container in all directions.

Q4: Why is it easy to push a nail into a wooden plank by the pointed end?

Ans: It is easy to push a nail into a wooden plank by pointed end because the smaller the area, larger the pressure on a surface for the same force. The area of the pointed end of the nail is much smaller than that of its head. The same force, therefore, produces a pressure sufficient to push the pointed end of the nail into the wooden plank.