



মহাশিক্ষা বিভাগ (মাম)

**DEPARTMENT OF EDUCATION (S)**  
Government of Manipur

## CHAPTER -11

### FORCE AND PRESSURE

#### **SOLUTIONS:**

#### **EXERCISES:**

Q1. Give two examples each of situations in which you push or pull to change the state of motion of objects.

Answer: Two example of push are:

1. A heavy box at rest is pushed to move from one room to another.
2. A child pushes a moving rubber tyre to increase its speed.

Two example s of pull force are:

1. Rope is pulled to draw water from well.
2. A drawer is pulled to open.

Q2. Give two examples of situations in which applied force causes a change in the shape of an object.

Answer: Two examples of situations in which applied force causes changes in the shape of an object are:

1. Making a chapati from a ball of dough.
2. Hanging a weight with a rubber band.



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Q3. Fill in the blanks in the following statements.

- (a) To draw water from a well we have to \_\_\_\_\_ at the rope.
- (b) A charged body \_\_\_\_\_ an uncharged body towards it.
- (c) To move a loaded trolley we have to \_\_\_\_\_ it.
- (d) The north pole of a magnet \_\_\_\_\_ the north pole of another magnet.

ANSWER.

- a. pull
- b. attracts
- c. push or pull
- d. repel

Q4. An archer stretches her bow while taking aim at the target. She then releases the arrow, which begins to move towards the target. Based on this information, fill up the gaps in the following statements using the following terms: muscular, contact, non-contact, gravity, friction, shape, attraction

- (a) To stretch the bow, the archer applies a force that causes a change in its \_\_\_\_\_.
- (b) The force applied by the archer to stretch the bow is an example of \_\_\_\_\_ force.
- (c) The type of force responsible for a change in the state of motion of the arrow is an example of a \_\_\_\_\_ force.
- (d) While the arrow moves towards its target, the forces acting on it are due to \_\_\_\_\_ and that due to \_\_\_\_\_ of air.

Answer:

- a. shape
- b. muscular
- c. contact
- d. gravity and friction



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Q5. In the following situations identify the agent exerting the force and the object on which it acts. State the effect of the force in each case.

(a) Squeezing a piece of lemon between the fingers to extract its juice.

(b) Taking out paste from a toothpaste tube.

(c) A load suspended from a spring while its other end is on a hook fixed to a wall.

(d) An athlete making a high jump to clear the bar at a certain height.

Answer:

Sl. no	Agent exerting the force	Objects in which it acts	Form of effect	Type of force
1	Fingers	i. Lemon as whole ii. Juice in side	Change in shape Change in state of motion	Muscular force of the lemon
2	Fingers	i. Tube as whole ii. Paste in side	Change in shape Change in state of motion	Muscular force of the toothpaste
3	Load	Spring	Change in shape	Weight of the suspended load on the spring
4	Ground from which athlete jump	Athlete itself	Change in state of motion	Muscular force of the Athlete on the ground.

Q6. A blacksmith hammers a hot piece of iron while making a tool. How does the force due to hammering affect the piece of iron?

Answer: Due to application of muscular force applied on hammer, the blacksmith can changes the shape of the piece of iron.

7. An inflated balloon was pressed against a wall after it has been rubbed with a piece of synthetic cloth. It was found that the balloon sticks to the wall. What force might be responsible for the attraction between the balloon and the wall?

Answer: The force responsible for the attraction between the balloon and wall is electrostatic force.

8. Name the forces acting on a plastic bucket containing water held above ground level in your hand. Discuss why the forces acting on the bucket do not bring a change in its state of motion.

Answer: The force acting on a plastic bucket containing water held above ground level in our hand are

1 gravitational force (acting downward)

2 muscular force (acting upward)

The gravitational force which is acting downward and muscular force of our hand which is acting upward are balanced each other since they are equal and opposite in direction. So the forces do not bring any change in the state of motion on the bucket.

Q9. A rocket has been fired upwards to launch a satellite in its orbit. Name the two forces acting on the rocket immediately after leaving the launching pad.

Answer: The two forces acting on the rocket immediately after leaving the launching pad are:

1 Gravitational force which is acting vertically downward and

2 Frictional force due to the air.

Q10. When we press the bulb of a dropper with its nozzle kept in water, air in the dropper is seen to escape in the form of bubbles. Once we release the pressure on the bulb, water gets filled in the dropper. The rise of water in the dropper is due to

(a) pressure of water.

(b) gravity of the earth.

(c) shape of rubber bulb.

(d) atmospheric pressure

Answer : The rise of water in the dropper is due to

(d) atmospheric pressure.



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## EXTRA QUESTIONS AND ANSWERS

Q1. What is a force?

Answer: Force is an external agency which can change or tends to change the state of rest or motion or shape of a body.

Q2. When does a force come to play?

Answer: A force is said to be come into the play only if it shows its effects on the object on which it is applied.

Q3. What is a contact force?

Answer: Forces that can be applied only when it is in contact with an object is called contact force.

Q4. What is muscular force?

Answer: Force resulting due to the action of muscles is known as muscular force. Example: Bullocks or horses carry heavy loads with muscular force.

Q5. What is a non-contact force?

Answer: Forces which do not involve contact between two bodies on which they act are called non-contact forces.

Q6 . Define the following

- a. Magnetic Force
- b. Electrostatic force
- c. Gravitational Force

Answer:

- a. **Magnetic force:** Forces exerted by magnets on iron and other magnets are called magnetic force. Examples: (a) Attraction of iron by a magnet when brought near to it. (b) Repulsion of two magnets when their same poles are brought together.
- b. **Electrostatic force:** The forces exerted by a charged body on another charged or uncharged body is known as electrostatic force. Example: A straw rubbed with paper attracts another straw and repels it if it is also been rubbed with a sheet of paper.

- c. **Gravitational force:** Every object in the universe exerts a force on every other object. This force is known as gravitational force. Example: Force of gravity due to which every objects fall towards the earth.

Q7. What happens when two forces act in the same direction?

Answer: When two forces act in the same direction they added to one another.

Q8. How an applied force does changes the speed of an object?

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

Q9. How does a goal keeper stop a ball?

Answer: The goal keeper applies a force on the ball in opposite direction to that of its speed motion and thus stops the ball.

Q10. “In a tug of war the rope does not move in any direction”. What does this mean explain?

Answer: It means that both side in the tug of war are applying equal force to pull the rope. An object does not change its position if same force are applied on it in opposite direction.

Q11. . What is the net force when two forces are applied on an object in the opposite direction?

Answer: If two forces act on an object in opposite directions, the net force is the difference between the two forces.

Q12. Why the speed of the tyre increases whenever it is pushed by a child?

Answer: The speed of the tyre increases when it is pushed by a child because force applied on an object in the direction of its motion increases the speed of the object.

Q13. What is the state of motion?

Answer: The state of motion of an object is described by its speed and the direction of motion. The state of rest is considered to be the state of zero speed. An object may be at rest or in motion; both are its states of motion.

Q14. Is it possible that a force is applied on an object may not bring any change in it? Explain with example.

Answer: Yes, it is possible that a force applied on an object may not bring any change in it. If the force is sufficient, then the object will definitely move but if it is not sufficient the object will not move. Eg we cannot move a wall even if we apply maximum force we can exert.

Q15. . What is muscular force? Why is it a contact force?

Answer: The force resulting due to the action of muscle is called muscular force. It is called a contact force because muscles are in direct contact with the object on which force is applied while applying force.

Q16. What is Electrostatic force a non-contact force?

Answer: Electrostatic force is the force exerted by charged body on another charged or uncharged body. It is called a non-contact force because they pull or push an object without touching them.

Q17. Why potter place a round piece of cloth on their head when they have to carry heavy loads?

Answer: Potters place a round piece of cloth on their head when they have to carry heavy loads because this increases the area of the contact of the load with their head. So, the pressure on their head is reduced and they find it easier to carry the load.

Q18. Why are shoulder bag provided with broad straps?

Answer: Shoulder bags are provided with broad straps because it decreases the pressure by increasing the surface area which makes it easier to carry them.

Q19. Why is it easier to push a nail in a wooden plank through its pointed end?

Answer: it is easy to push a nail in a wooden plank through its pointed end because small area of the pointed end help in creating more pressure and it become to easier to insert the nail.

Q20. How does a rubber sucker works?

Answer: When we press the rubber sucker, the air between its curves and the surface escapes out. Then the atmospheric pressure acts on the sucker and makes it stick to the surface.

Q21. Tick true/false against the following statements.

- i. Force can change the direction of motion of an object. ( )
- ii. The speed of the object decreases if the force applied is in the direction of its motion. ( )
- iii. Force applied on an object in the same direction adds to one another. ( )
- iv. Muscular force is a type of non-contact force. ( )
- v. Gases do not exert pressure on the walls of their container. ( )
- vi. The net force of an object is zero if the two forces acting on it in opposite direction are equal. ( )
- vii. Muscular force can be applied only when it is in contact with an object. ( )
- viii. The force of friction arises without contact between two surfaces. ( )
- ix. The strength of a force is usually expressed by its magnitude. ( )
- x. The force of friction always acts opposite to the direction of the motion of the body. ( )

Answer:

- i. True
- ii. False
- iii. True
- iv. False
- v. False
- vi. True
- vii. True
- viii. False
- ix. True
- x. True



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