CLASS – 6 PHYSICS CHAPTER – 3 FORCE [EXERCISE]

A. Choose the correct option.

1. Which of the following is not an effect of force?
Answer : (c) A force can change the composition of a moving object

2. Which of the following is a contact force?
Answer : (a) Friction

3. Four children were asked to arrange forces due to rolling, static and sliding frictions in a decreasing order. The correct arrangment is :
Answer : (b) rolling, sliding, static

4. A big wooden box is being pushed on the ground from east to west direction. The force of friction due to ground will act on this box towards :
Answer : (c) east direction

5. The friction between two surfaces does not depend on one of the following. This one is :
Answer : (a) amount of surface area of the two objects which is in contact with each other.

6. If the sliding friction between two surfaces is found to be 8 N, then the static friction between these two surfaces is most likely to be :
Answer : (b) 10 N

7. Which of the following is not an advantage of friction?
Answer : (c) It enables rubber pads to be rubbed off

8. Which of the following statements is incorrect?
Answer : (b) Sliding friction is less than rolling friciton

9. Which of the following does not have a streamlined shape?
Answer : (d) Bus

10. Ball bearing is a device which usually converts :
Answer : (c) sliding friction into rolling friction

B. Fill in the blanks.

1. Force could be a……..or a…….
Answer : push or a pull.

2. Friction is a……force.
Answer : contact

3. Friction always opposes……between the surfaces in contact with each other.
Answer : motion

4. Sliding friciton is…….than the static friction.
Answer : less

5. Shapes that are designed to reduce air resistance are called……shapes.
Answer : streamlined

6. Magnetic force is a……force.
Answer : non-contact

7. Friction force is an example of……force.
Answer : contact

8. Friction opposes the……..of a moving object.
Answer : motion

C. Write T for True and F for False statements.

1. Force can change the shape of an object.
Answer : True

2. Force can make an object disappear.
Answer : False

3. A push or a pull acting on an object is called force.
Answer : True

4. Force can change the direction of a moving object.
Answer : True

5. Friction always acts in the same direction as the motion.
Answer : False

6. Fricitonal force depends on the types of surfaces in contact.
Answer : True

7. Friction does not act on a bird flying in the air.
Answer : False

8. Static friction is less than sliding friction.
Answer : False

D. Give two examples.

1. A force can move a stationary object.
Answer : (i) Take a rubber ball and place it on table top. Now gently push the ball along the surface of table, the ball begins to move.
(ii) If we kick a stationary football kept on the ground, then the football starts moving.

2. A force can change the shape (and size) of an object.
Answer : (i) When we strwch a rubber band then it's **shape and size changes**.
(ii) When we apply **force** to doe then it's **shape and size changes**.
(iii) When we apply **force** to clay then it's **shape and size changes**.

3. Non-contact forces
Answer : (i) Magnetic force
(ii) Electrostatic force
(iii) Gravitational force

4. Contact forces
Answer (i) Muscular force
(ii) Frictional force

5. Types of friction
Answer : (a) Static friction
(b) Sliding friction
(c) Rolling friction

6. Lubricants
Answer : Oil, grease, graphite and fine powder.

E. Match the columns.

Column I	Column II
1. Grooved shoe sole	a. Opposes the movement
2. Ball bearing	b. Streamlined structure reduces friction
3. Oil and grease	c. Walking
4. Aeroplane and ships	d. Change sliding friction to rolling friction
5. Friction	e. Lubricants

Answer : 1 – c, 2 – d, 3 – e, 4 – b, 5 – a

F. Answer the following questions in short.

1. What is a force? Write any two effects of force.
Answer : A push or a pull on an object is known as force.
Effects of force :
(i) A force can move a stationary object.
(ii) A force can stop a moving object.
(iii) A force can change the speed of a moving object.

2. Name any two contact and two non-contact forces.
Answer : Contact Forces :
(i) Muscular force
(ii) Frictional force
Non-contact Forces :
(i) Magnetic force
(ii) Electrostatic force
(iii) Gravitational force

3. Name the force which always opposes motion.
Answer : The force which always opposes the motion of one body over another body is called frictional force.

4. What is the unit of force?
Answer : The standard unit of force is Newton (N).

5. Name the types of force that we observe in daily life.
Answer : Frictional force
(i) Static friciton
(ii) Sliding friction
(iii) Rolling friction

6. Write two methods to reduce friction.
Answer : (i) Making the surfaces smooth by polishing.
(ii) Reducing the area of contact between the two rubbing surfaces.
(iii) Inflated tyres and tubes.

7. Give two examples that friction produces heat.
Answer : (i) When we rub our hands then due to friction hands produces heat (which make them feel warm).
(ii) When we operate a mixer or a grinder for a few minutes, its jar becomes hot. Here again heat isproduced by friction.

8. State two advantages of friction.
Answer : Advantages of friction :
(i) Friction enables us to walk.
(ii) Friction enables a car to move on road without skidding.
(iii) Friction enables us to apply brakes and slow down or stop a moving car.

9. A rough surface has greater friction than a smooth surface. Why?
Answer : This is because rough surface offers more resistance to the movement of an object over it compared to a smooth surface. More friction is produced on a hard surface than on a smooth surface it takes more force and brute strength to push something heavy on a rough surface, because it falls in the cracks.

G. Answer the following questions in detail.

1. Explain all the effects of force with examples.
Answer : Effects of Force :
(i) A force can move a stationary object.
For example : Take a rubber ball and place it on a table top. Now, gently push the ball along the surface of the table. The ball begins to move. Thus, a ball at rest (or stationary ball) begins to move when a force (of push) is applied to it.
(ii) A force can stop a moving object.
For example : In a football match, when the goalkeeper dives or jumps up to save the goal, he applies a force to the moving football with his hands. This force applied by the goalkeeper helps in stopping the moving football.
(iii) A force can change the speed of a moving object.
For example : When we pedal the bicycle faster, then the speed of bicycle increases and when we apply brakes to the moving bicycle then the speed of bicycle decreases.
(iv) A force can change the direction of a moving object.
For example : In a cricket match, when a moving cricket ball is hit by a bat, then the direction of cricket ball changes and it goes in another direction. The force exerted by bat changes the direction of moving cricket ball.
(v) A force can change the shape (and size) of an object.
For example : When we hammer a piece of aluminium metal its shape changes and aluminium sheet is formed.

2. What is the difference between contact and non-contact forces? Explain with one example of each.
Answer : Difference :

	Contact Forces	**Non-contact Forces**
1.	A force which can be exerted by an object on an another object only through 'physical touching' is called a contact force.	A force which can be exerted by an object on an another object even from a distance (without touching each other) is called a non-contact force.
2.	There is a physical contact between the object which exerts the force and the object on which the force is exerted.	There is no physical contact between the object which exerts the force and the object on which the force is exerted.
3.	**Examples :** **(i)** Muscular force **(ii)** Frictional force	**Examples :** **(i)** Magnetic force **(ii)** Electrostatic force **(iii)** Gravitational force

3. What are the factors that affect the friction? Explain in detail.
Answer : There are two factors on which friction depends :
(i) The nature of the two surfaces (smoothness or roughness of the two surfaces) : When the two surfaces in contact are smooth, then the friction between them will be less (because the interlocking of smooth surfaces is less). As the degree of roughness of the two surfaces in contact increases, the friction also increases. And when the two surfaces in contact are very rough, then the friction between them will be more (because the interlocking of very rough surface is too much).

(ii) The force with which the two surfaces are pressed together : If the two surfaces of objects are pressed together harder by a greater force, then the friction will increase (because pressing together two surfaces of object with a greater force will increase the interlocking in the two surfaces).

4. What is the difference between static, sliding and rolling frictions?
Answer : Difference :
Static friction : The maximum frictional force present between any two objects when one object just tends to move or slip over the surface of the other object, is called static friction.
In case of static friction, the object is actually not moving or sliding over the other object, it tends to move or slide.

Sliding Friction : The frictional force present when one object moves slowly (or slides) over the surface of another object, is known as sliding friction.
The sliding friction comes into play when an object is sliding (moving slowly but continuously) over another object.

Rolling Friction : When an object (like a wheel) rolls over the surface of another object, the resistance to its motion is called rolling friction.
It is always easier to 'roll' than to 'slide' an object over another object. So, rolling friction is much less than sliding friction.

5. Friction is a necessary evil. Explain.
Answer : Frictional force causes a lot of losses in general upkeep and wear and tear of machinery. Hence it is considered as a evil. But almost all crucial tasks cannot be carried out without the presence of friction. Hence it is considered as a necessary evil .
For example : When we walk on the road, there is friction between the soles of our shoes and the surface of the road, due to this friction it is easier to walk but there is a disadvantage of this friction which is when the soles of our shoes rub against the rough surface of the road, then tiny pieces of the soles keep on breaking off slowly due to which the soles of our shoes wear out gradually.

6. Write four ways to increase friction.
Answer : Methods of Increasing Friction :
(i) Grooves are made in the shoes of players and athelets to increase friction and prevent slipping.

(ii) Gymnasts apply some coarse substance on their hands to increase friction for better grip.

(iii) Machine belts are made of special materials to increase the friction and drive machine wheels properly.

(iv) By increasing the mass of the object causing friction.