Class 08 Chapter: 12 Friction Exercises Answer Book Science mission

A. Multiple choice questions.

1. A box lying on the floor is being pushed from right to left. The force of friction on the box will act

(a) From right to left (b) From left to right (c) In all directions (d) Downward

2. Force that opposes the motion of a body in contact with the surface of another body is

(a) Attraction (b) Repulsion (c) Friction (d) None of these

3. Force of friction is a (a) Contact force (b) Non-contact force (c) Both (d) None of these

4. A place where there is no friction is (a) High hills (b) Space (c) In the air (d) Under water

5. Providing wheels on a moving body helps in

(a) Increasing friction (b) Decreasing friction (c) Giving shape to the body (d) None of these

6. Which of the following helps easy motion of fish in water

(a) Round shape (b) Angular shape (C) Streamlined shape (d) Elongated shape

7. Moving bicycle will stop moving when you stop pedalling due to

(a) Non-availability of muscular force (b) Friction (c) Lubrication (d) None of these

8. Ball bearings are used to

(a) Increase friction (b) Decrease friction (c) Add to the area in contact (d) Making surfaces smooth

9. Shape of an airplane has been designed as per the shape of

(a) A frog (b) A snake (c) Deer (d) Flying bird

10. Frictional force increases with the increase in

(a) Weight of the object (b) Surface contact area (c) Roughness of the surface (d) All of these

11. Which of the following will show maximum friction?

(a) Walking on a rough road with rubber sole shoes (b) A boat being rowed in water

(c) A cycle with flat tyre on the road

(d) Rubbing rough side of a sand paper on the rough side of another sand paper

12. Shape of a sharpened pencil to reduce friction resembles the shape of

(a) Fish (b) Boat (c) Rocket (d) Airplane

Ans: 1. b 2. c 3. A 4. b 5. b 6. c 7. b 8. b 9. d 10. d 11. c 12. c

B. Fill in the blanks.

1. Friction is the force that opposes …. 2. Friction acts in direction …….. to the direction of motion.

3. Friction offered by a body at rest to move it is called.....

4. Shape of the body of a flying bird is _____ shape.

5. Shape of an airplane is similar to a _____ in flight. 6. Soles on shoes are grooved to -------- friction.

7. Friction from fluids is also called _____ 8. Sliding friction is _____ than the static friction.

9. Sliding friction is _____than the rolling friction. 10. To reduce drag the shape given to a boat is ____.

11. Friction is harmful but it is a ____evil.

12. Brake system is the application of _____ to slow down a vehicle in motion.

Ans: 1. Motion 2. Opposite 3. Static friction 4. Streamline 5. Bird 6. Increase

7. Drag 8. Less 9. More 10. Streamline 11. Necessary 12. Friction

C. State whether 'true' or 'false'.

1. Friction is an evil which is always harmful.False

2. Rolling friction is greater than sliding friction. False

3. Lubricant is used to reduce friction. True

4. Wrapping of a polythene sheet on a brick increases friction while it is moved on a floor. False

5. Friction from a fluid on a moving object through it also called drag. True

6. More the weight of an object less is the friction on moving it on a surface. False

7. Heat is generated when an object rubs against the surface. True

8. Once you kick a ball it rolls forever. False 9. Friction from air makes the meteor burn. True

D. Give one word answers.

1. Name of the force which resists the motion of a body while moving on a surface. 1.Friction

2. Force of friction exerted by a body at rest. 2. Static

3. Force of friction to slide an object on a surface. 3. Sliding

4. Force of friction to move an object over rollers. 4. Rolling

5. Giving special shape to the body to reduce friction. 5. Streamlining

6. Reducing friction by oiling surfaces. 6. Lubrication

7. The other name of friction offered by fluids. 7. Drag

Theoretical Questions A. Short answer type questions.

1. What is frictional force? Define it.

Ans: The force which oppose the motion of a body is termed as force of friction.

2. What are the two main factors that affect friction between two solid surfaces?

Ans: Friction between surfaces depends upon two factors:

(i) The force with which two surfaces are pressed together; and (ii) Nature of the surfaces: smooth or rough.

3. Why engine on a motorboat is switched off much ahead of approaching the shore?

Ans: The ship or the boat continues to be in motion even on stopping (putting off) its engine. Water offers friction force that slow down or stop it by the time it touches the shore. This is why engine on a motorboat is switched off much ahead of approaching the shore.

4. Why do we provide brakes on vehicles?

Ans: Brakes are used to reduce speed or to stop a moving vehicle . when break lever is pressed, the break pads rub against the wheels exerting a frictional force to bring the vehicle to slow down or stop.

5. Earth is moving round the sun without slowing down. Why?

Ans: There is no air in space in which the earth is revolving round the sun hence the motion of the earth does not face any friction and so there is no slowing down of the revolving earth.

6. What may happen if the tyres on your car have lost grooves due to overuse and you are running fast on a rainy day?

Ans: The grooves provide better grip and increase friction between the surface of the wheel and the road to help movement. If grooves are lost then car wouldn't stop if you want to stop it by applying brake. Also it will skid on wet surface.

7. What are the advantages of providing rollers on your travelling suitcase?

Ans: Rollers in a suitcase reduce the sliding friction into rolling friction help to move the suitcase comfortably.

8. Why it is not safe to walk on wet glassy ice with rubber soled shoes?

Ans: wet glassy ice does not offer friction essential to walk on So, we may slip .Hence it is not safe to walk on glassy ice with rubber soled shoes.

9. Why thick iron chains are wound on wheels of cars being driven on snow?

Ans: The chains on tyres create a rough surface on wheels which increase friction to some extent and this helps the movement of vehicle on roads covered with ice.

10. What type of shoes are worn by the mountaineers and why?

Ans: Mountaineers use spiked shoes while going on trekking on snow on high hills. These give better grip and friction all the time.

11. What do you understand by lubrication? Explain giving examples.

Ans: Lubrication reduces friction on the surfaces in contact by filling up the gap between ridges and furrows with the lubricant (oil or grease), reducing interlocking. A thin layer of lubricant around the axle on which a wheel rotates reduces friction.

12. What may happen if soap water is spilled over the marble floor?

Ans: Floor becomes slippery when soap water is spilled over marble floor because friction is highly reduced with soap water on a marble floor.

13. Why it is necessary to replace the brake pads in the cycle quite often?

Ans: On pressing the brake lever, the brake pads press against the rim of the wheels and offer resistance to reduce the motion of the wheel (vehicle). In the process they get wear and tear. Therefore it is necessary to replace the brake pads in the cycle quite often.

14. What factors help lighting a matchstick on rubbing it on the side of a match box?

Ans: The two sides of a matchstick are coated with red phosphorus paste. When the head of the matchstick is rubbed against this surface friction between matchstick and the match box help to produce spark and lit the matchstick.

15. Will the friction increase or decrease if we increase the weight of the object in motion on a surface and why?

Ans: Friction force depends on the mass of objects. Friction between an object and the surface on which it moves increases with increase in weight of a moving object .

16. Why do we give streamlined shape to the objects moving fast on earth, water and air?

Ans: A streamline shape reduces the friction offered by fluid and helps object move smoothly.

17. Why is the conveyer belt (V belt) made of rough material?

Ans: The conveyer belt (V belt) is made of rough material To increase the grip of the belt on wheels

18. Why do carrom coins move faster when the board is powdered?

Ans: The particles of powder make surface smooth and help carrom coins move faster on the board.

19. Why it is easier to tie a knot on a string of cotton than on a string of silk?

Ans: Silk fibre has a smooth and slippery surface whereas cotton is not so smooth as such it is easier to tie a knot on a string of cotton than on a string of silk.

20. What is the principle used in ball bearings?

Ans: Ball bearings change sliding friction into Rolling friction. The principle used in ball bearings is that rolling friction is lesser than sliding friction.

B. Long answer type questions.

1. Give reasons for the following:

a. Streamlined shape of the fish helps it in swimming in water.

Ans: Streamlined shape of the fish reduce friction offered by water and helps it in swimming in water

b. Car engine gets heated on running.

Ans: Friction generates heat. The parts of an engine on running car are rubbing against each other hence they get heated

c. It is always easier to roll an object than to slide it on surface.

Ans: Friction force increases with increase in surface area in contact. In rolling less surface area is in contact than sliding. Less friction force resists the motion of the object on rolling. That's why it is easier to roll than to slide.

d. Friction decreases with the reduction in the area of contact between two surfaces.

Ans: More the area of surface in contact between two objects, more is the friction. Therefore, friction decreases with the reduction in the area of contact between two surfaces.

e. Meteors burn on entering into the earth's atmosphere.

Ans: Meteors pieces of rocks revolving around the sun between the orbits of Mars and Jupiter. Some meteors slip away towards the earth and enter the atmosphere of the earth . Friction between asteroid and the air generates heat to burn it.

2. Explain some methods for reducing friction.

Ans: Friction is reduced by making the surfaces smooth and this is done by

(i) Lubricating the surfaces make surface smooth and reduce friction

(ii) Polishing (or buffing) the surfaces in contact make them smooth by removing irregularities on the surfaces, thus reducing friction.

(iii) Use of wheels reducing the area of contact between two surfaces and reduce friction

3. What are the advantages and disadvantages of force of friction?

Ans: Advantages of friction:

(i) Friction help us to walk on ground (ii) Friction help us to hold objects

(iii) Friction help us to write on paper (iv) Friction help us to apply break

Disadvantages of friction

(i) Friction reduces the speed of a body in motion. Thus, friction results in higher consumption of energy.

(ii) Friction generates heat which reduce efficiency of machine.

(iii) Friction results in wearing out of the rubbing surfaces.