ODM EDUCATIONAL GROUP
Changing your Tomorrow

FORCE

SUBJECT-PHYSICS

CHAPTER NO- 3

Summarization of the chapter, discussion of exercise questions

PERIOD-8

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LEARNING OBJECTIVE

- Students will be able to
- Understand that forces are due to an interaction like push or pull
- Understand the concept of force as a stretch and force as a squeeze.
- Familiarize with the effects of force
- Describe the different effects of force with appropriate examples
- familiarize with the different kinds of forces
- Describe the different kinds of forces with appropriate examples
- Relate different kinds of forces in real life situations.
- Sensitize about the force of friction
- familiarize with the effects of friction
- Describe the different effects of friction with appropriate examples
- familiarize with the kinds of friction
- Describe the different kinds of friction with appropriate examples
- Know the disadvantages of friction
- familiarize with the ways of reducing friction
- familiarize with the advantages of friction
- Describe the different ways of increasing friction with appropriate examples

WARM UP QUESTIONS

- Teacher should ask certain questions based on the previous classes followed by group discussion.

Practice and Discussion with Students- Chapter Review

- Review of the whole chapter
- Discussion of exercise question answers

A. Objective Questions

1. Write true or false for each statement

(a) The frictional force acts in the direction of motion of body
Answer. False

(b) The unit of weight is kilogram
Answer. False

(c) A force can change the direction of motion of a moving body.
Answer. True

(d) A force increases the mass of the body when applied on it.
Answer. False

(e) The force of friction is always disadvantageous.
Answer. False

(f) The sliding friction is more than the rolling friction.
Answer. True

(g) Liquids offer more friction than the gases.
Answer. True

(h) A wet oily road offers more friction than a dry rough road.
Answer. False

2. Fill in the blanks

(a) Force is applied as **push** or **pull.**
(b) On squeezing a gum tube, its **shape** changes.
(c) On pulling a string, its **length** increases.
(d) A moving football when kicked, its **direction of motion** changes.
(e) On applying brakes on a moving car, its speed **slows down.**
(f) We use ball bearings to **reduce** the friction.
(g) Friction **opposes** the motion.
(h) Lubricants are used to **reduce** friction.
(i) Friction causes wear and tear of moving parts of machine.

- Match the following

Answer.

Column A	Column B
(a) Non contact force	(iii) Gravitational force
(b) Like poles	(i) repel
(c) Contact force	(v) force of friction
(d) Mass	(ii) kg
(e) Weight	(vi) kgf
(f) Friction	(iv) wear and tear

4. Select the correct alternative

(a) A body falls downwards because of

1. electrical force
2. **gravitational force**
3. mechanical force
4. magnetic force.

(b) A force does not change

1. **mass**
2. length
3. shape
4. state of motion.

(c) A force to be expressed correctly requires

1. only the magnitude
2. only the direction
3. **both the magnitude and direction**
4. none of the above.

(d) Friction

1. promotes motion
2. **opposes motion**
3. acts in the direction of motion
4. is always a nuisance.

(e) Friction is reduced by

1. **making the surfaces wet**
2. making the surfaces dry
3. making the surfaces rough
4. sprinkling sand on the surface.

(f) Friction

1. causes wear and tear
2. produces heat
3. stops a moving body
4. **has all the above disadvantages**

(g)

1. an oil is sprayed
2. the surfaces are made wet
3. **the surfaces are made dry**
4. the surfaces are polished

B. Short/Long Answer Questions

Question 1.

Name the term used for the push or pull ?

Answer:

Force

Question 2.
Give one example each of a force as

1. a push
2. as pull
3. a stretch and
4. a squeeze.

Answer:

1. **a push** — To1 open a door, we push it.
2. **as pull** — To move a grass roller on a lawn, it is pulled by a gardener.
3. **a stretch** — Stretching a rubber string.
4. **a squeeze** —Change in shape of a sponge on squeezing.

Question 3.
Explain the meaning of the term force.
Answer:
Force: Force is a physical cause that changes or may tend to change the state of rest or the state of motion of an object. The S.I. unit of force is Newton.

Question 4.
What effect can a force have on a stationary body ?
Answer:
When a force is applied on a stationary body, it begins to move.

Question 5.

What effects can a force have on a moving body ?

Answer:

When a force is applied on a moving body, it can be made to stop or it can change the direction of motion.

Question 6.

What effect can a force produce on a body which is not allowed to move ?

Answer:

When a force is applied on a body which is not free to move, it gets deformed i. e., the shape or size of the body changes.

Question 7.

Give one example each to indicate that the application of a force

1. produces motion
2. stops motion
3. slows down motion
4. changes the direction of motion
5. deforms a body

Answer:

1. A car originally at rest when pushed, begins to move.
2. A moving bicycle is stopped by applying the brakes.
3. The speed of a moving vehicle is slowed down by applying the brakes.
4. A player kicks a moving football to change its direction of motion.
5. On stretching a rubber string, its length increases.

Question 8.

State the effect produced by a force in the following cases :

(a) The sling of a rubber catapult is stretched

(b) A man pushes a heavy cart

(c) A player uses his stick to deflect the ball .

(d) A cyclist applies brakes

(e) A spring is compressed.

Answer:

(a) The shape and size of catapult changes i.e., its length increases.

(b) The heavy cart begins to move.

(c) The direction of the ball changes.

(d) The speed of the moving cycle is slowed down.

(e) There is change in size and shape of spring.

Question 9.

Name the two kinds of forces in nature.

Answer:

Two kinds of forces in nature are :

1. Contact forces
2. Non contact forces

Question 10.

Name the type of force which acts in the following cases:

Answer:

(a) A coolie lifts a luggage

Answer. Muscular force

(b) A bicycle comes to rest slowly when the cyclist stops pedalling

Answer. Frictional force

(c) A stone falls from a roof

Answer. Gravitational force.

(d) A comb rubbed with silk attracts the bits of paper

Answer. Electrostatic force

(e) A string hangs with a load

Answer. Force of tension.

(f) A horse moves a cart

Answer. Muscular force

(g) A magnet attracts an iron pin

Answer. Magnetic force

(h) A boy opens the door

Answer. Muscular force

(i) An apple falls from a tree

Answer. Gravitational force

(j) A man rows a boat.

Answer. Muscular force.

Question 11.
What do you mean by the gravitational force? Give an example to illustrate it.
Answer:
The force of attraction on a body by earth is called gravitational force.
Example : The leaves and fruits fall from a tree downwards towards the ground, water in a river flows down streams, a ball thrown up goes to a height and then returns back on ground are some examples of motion due to gravitational force.

Question 12.
Define the term "weight of a body"
Answer:
Weight: The weight of the body is the force with which the earth attracts it towards the centre. It depends on acceleration due to gravity.

Question 13.
What do you understand by the term friction?
Answer:
Friction: Friction is that force which opposes the relative motion between the two surfaces that are in contact with each other.

Question 14.

Give an example to illustrate the existence of force of friction.

Answer:

If we stop paddling our bicycle, it gradually slows down and ultimately it stops after travelling a certain distance. This is due to frictional force between bicycle and ground.

Question 15.

What is the cause of friction?

Answer:

The cause of friction is the interlocking of the irregular projections on the two surfaces in contact.

Question 16.

State two factors which directly affect the force of friction.

Answer:

Two factors which directly affect the force of friction are :

1. The smoothness of the surface.
2. The presence of solid, liquid or gas around the moving body.

Question 17.

In which case will there be more friction between the truck and the road : when the truck is empty or when it is loaded ?

Answer:

When the truck is loaded there will be more friction between the truck and the road.

Question 18.
Which offers more friction on a body : a glass surface or a wooden surface ?
Answer:
Wooden surface offers move friction on a body.

Question 19.
Name the three kinds of friction.
Answer:
Friction is of three kinds :

1. Static friction
2. Sliding friction,
3. Rolling friction

Question 20.
List three disadvantages of friction.
Answer:
Disadvantages of friction:

1. Friction produces heat which damages the moving parts of a machine.
2. Friction produces wear and tear on the contacting surfaces. This reduces the life of machine parts, tyres and shoe soles.
3. A lot of energy is wasted due to friction to overcome it before moving.

Question 21.
When you apply the brakes, the bicycle stops and the rim of the wheel becomes hot. Explain the reason.
Answer:
It is due to friction betwen the brakes and the rim of the wheel that it becomes hot.

Question 22.
The eraser gets smaller and smaller as you use it more and more. Explain the reason.
Answer:
The eraser gets smaller and smaller as we use it more and more due to frictional force causing wear and tear of the eraser.

Question 23.
List three ways of reducing friction.
Answer:
Ways to reduce friction:

1. Providing ball bearings or wheels between the moving parts of machine or vehicles reduce friction and allow smooth movement as rolling friction is less than sliding friction.
2. Oiling or lubricating (with graphite or grease) the moving parts of a machine reduces friction. Fine powder like talcum powder also works as a lubricant to reduce friction.
3. Polishing the rough surface reduces friction offered by it.
4. Streamlining (giving special shape to experience minimum drag) the bodies of aeroplanes, cars, boats and ships help reduce drag (fluid friction) while travelling through air or water.

Question 24.

It is difficult to open an inkpot with greasy or oily hands. Explain.

Answer:

When the hands are oily, then the oil acts as lubricant and reduces the friction. As the friction force is less, it is difficult to get grip of the inkpot and it becomes difficult to open it.

Question 25.

It is difficult to walk on a wet road. Explain.

Answer:

When the road becomes wet after rain, friction is reduced and hence, the road becomes slippery.

Question 26.

Give three examples to illustrate that friction is a necessary evil.

Answer:

The examples to illustrate that friction is a necessary evil are:

1. If friction were absent, we would not be able to walk.
2. Friction is necessary to burn a matchstick.
3. It is due to friction that we can write on a board by a chalk.

Question 27.

Define

1. static friction
2. sliding friction and
3. rolling friction

Answer:

1. The maximum force exerted by a surface on a body so long as it remains stationary is called the force of static friction.
2. The minimum force required to keep the body moving over a surface such that it moves equal distances in equal intervals of time is called the force of sliding friction..
3. The minimum force required to roll a body on a surface is called the force of rolling friction.

Question 28.

Arrange the following in descending order :

1. static friction
2. sliding friction and
3. rolling friction?

Answer:

Static friction > Sliding friction > Rolling friction.

Question 29.

A body needs a force F_1 just to start motion on a surface, a force F_2 to continue its motion and a force F_3 to roll on the surface. What is

1. the static friction
2. sliding friction and
3. rolling friction ? State whether F_2 is equal, less than or greater than (1) F_1 and (2) F_3.

Answer:

1. F_1 = Static friction
2. F_2 = Sliding friction
3. F_3 = Rolling friction

   $F_1 > F_2 > F_3$

   F_2 is less than F_1 but greater than F_3.

HOME ASSIGNMENT

- Exercise- A 1,2
- All exercise question answers of text book.

THANKING YOU

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