KALPAVRUKSHA MODEL SCHOOL

Answers of Assignments-5

Class: VIII **Sub: Physics** **Date: 7.08.2021**

Topic: FORCE AND FRICTION

I. Answer the following questions:

1) Explain why ball bearings are used and how they are helpful?

ANS: Ball bearings are used to reduce friction. Ball bearings change sliding friction to rolling friction. This is a very useful thing to do since rolling friction is much smaller than sliding friction. Ball bearings are used in most mechanical structures which have moving parts. Small metal balls made of stainless steel, brass ceramic etc., are placed between moving surfaces to reduce friction.

2) What are the factors that affect fluid friction?

ANS: The factors that affect fluid friction are:

- Speed of the object.
- Shape of the object.
- Size of the object.
- nature of the fluid

3) Explain why objects moving in fluids must have special shapes?

ANS: The object moving in fluids must have a special shape. This type of shape is called streamlined shape. The streamlined shape helps to overcome the friction between objects and fluids. The objects have pointed fronts with little broader middle portion which gets tapered at the back. When cars and aero planes move at very high speeds, their motion is opposed by friction offered by the air molecules surrounding them. The friction of air produces what is called drag, which opposes the motion of the vehicle. The same applies to ships and boats. To reduce drag, automobiles, ships and aero

planes are given a special shape, called a streamlined shape. An automobile with a streamline body experiences minimum resistance when travelling through air. Even sea creatures like fish and shark have streamline bodies, which make it easier for them to move with great speed in water.

4) What are the advantages and disadvantages of friction?

ANS: **Advantages of friction**

Friction plays an important role in our daily life.

a. Without friction we would slip and fall every time we attempt to walk or run. There is very little friction on a wet polished floor. That is why it is easy to slip on such a floor.
b. Friction causes nails and screws to hold on to walls.
c. It would not be possible to light a matchstick without friction between its head and the side of the matchbox.
d. Cars and buses are able to run on roads because of friction between the tyres and the road.
e. Without friction writing on paper would be impossible as the tip of the pen will slip on paper.
f. It is because of friction between the brake 'shoes' and wheels that bicycles and automobiles stop when brakes are applied.

Disadvantages of friction

a. Friction is a nuisance in some circumstances.
b. The heat produced in the moving parts of machinery due to friction results in wear and tear of the parts.
c. Forest fires are caused due to friction between branches of trees rubbing against each other.
d. Tyres of vehicles and soles of footwear wear out because of friction.
e. Energy is wasted in overcoming the force of friction.

5) What do you mean by 'streamlined shape'? How does it help in the motion of vehicles?

ANS: **Streamline shape:** A shape which is narrow in front and broader in the middle offers minimum friction when moving through air or water. When cars and aero planes move at very high speeds, their motion is opposed by friction offered by the air molecules surrounding them. The friction of air produces what is called drag, which opposes the motion of the vehicle. The same applies to ships and boats. To reduce drag, automobiles, ships and aero planes are given a special shape, called a streamlined shape. An automobile with a streamline body experiences minimum resistance when travelling through air. Even sea creatures like fish and shark have streamline bodies, which make it easier for them to move with great speed in water.

6) **Why does a matchstick light when we strike it on a rough surface?**
ANS: when we rub matchstick against the rough side of a matchbox then friction between both of them produces heat and this heat burns chemicals present at the head of matchbox and it lights up.

7) **Why do brake pads of bicycles have to be replaced quite often?**
ANS: When the brakes of a vehicle are applied, lot of friction is produced between the brake pads and moving part of the wheel. This friction wears out the brake pads gradually so brake pads of bicycles have to be replaced quite often.

8) **What prevents you from slipping every time you take a step forward?**
ANS: Friction prevents you from slipping every time you take a step forward.

9) **What happens when you rub your hands vigorously for a few seconds? Why does this happen?**
ANS: Rubbing of your palms makes you feel warm Friction can also produce heat. Vigorously rub your palms together for a few minutes.

10) **What enables us to fix a nail in a wall and knot to be tied?**
ANS: A nail is fixed in the wall and not to be tied due to friction

11) **How does bicycle stop when its brakes are applied?**
ANS: The friction between brake pad and rim prevents the wheel from moving ahead so finally bicycle stop when its brakes are applied.

12) **What makes the steps of foot over-bridges at railway stations wear out slowly?**
ANS: The steps of foot over-bridges at railway stations wear out due to friction caused by the shoes of extremely large number of people who use these over-bridges all the time.

13) **Why do gymnasts apply a coarse substance to their hands?**
ANS: gymnasts apply a coarse substance to their hands to increase friction for better grip.

14) **Why do kabaddi players rub their hands with dry soil?**
ANS: kabaddi players rub their hands with dry soil to increase friction for better grip on their opponent players.

15) **Why are treads made in the surface of tyres?**
ANS: treads made in the surface of tyres of vehicle to increase friction and prevent skidding of vehicles on wet roads.

16) **Explain why, oil or grease is applied to those parts of machine which are in motion?**

ANS: When oil or grease is applied between the moving parts of a machine a thin layer of oil is formed between the two rubbing surfaces. This layer of oil separates the two rubbing surfaces due to which interlocking is reduced to a large extent friction is reduced and movement becomes smooth.