

Ch-12

Friction

Q1. What is friction and write its types?

Ans. Friction opposes the relative motion between two surfaces in contact. It acts on both the surfaces.

Types of friction :-

- Static friction
- Rolling friction
- Sliding friction
- ~~Fluid friction~~

Define
★

Static :- Static friction is a type of friction which comes into action when we try to move an object at rest.

★ Sliding :- Sliding friction comes into action when an object is sliding over another. (Smaller than Static)

★ Rolling :- When one body rolls over another body, rolling friction comes into action. Rolling friction is smaller than sliding friction.

Ans. 4.

Advantages

- It allows us to grip and catch any object.
- It helps us to walk comfortably on the floor.
- It helps to minimise the speed of or to stop anything.
- It helps us to write.

Disadvantages

- It causes wear and tear in objects.
- It causes damage to the parts of the machines and tools ^{which} ~~and~~ requires money to get them repaired.
- It reduces the speed of moving objects so more force is required.
- It produces hurdle in moving objects freely.

Q2. Write the factors which affect friction

Ans. Following are the factors which affect friction:-

- Nature of surface.
- Area of contact.
- Weight of an object.

Q3 → How does friction depend on nature of surface?

Ans. Nature of surface is one of the factors affecting friction. When we move on any surface, we apply a force to overcome the interlocking of surfaces. Rough surfaces have a larger number of irregularities and greater frictional force.

Q4 → "Friction is a necessary evil." Why? What are advantages and disadvantages of friction? (Necessary evil)

Ans.

Q5. Explain why sliding friction is less than static friction?

Ans. When the box starts sliding, the contact points on its surface, do not get enough time to lock into the contact points on the floor. So, sliding is slightly smaller than the static friction. Hence, it is somewhat easier to move the box already in motion than to get it started.

Q6. Why are the soles of shoes and tyres of grooved?

Ans. Soles of our shoes are grooved to provide the shoes better grip on floor so we can move safely. Similarly tyres of vehicles are treated to increase friction for better grip.

Q7. Explain increasing and decreasing of friction with examples.

Ans. ~~Increase~~ Soles of our shoes are grooved to provide the shoes better grip on the floor so we can move safely.

- We increase friction by using break pads in brake system of bicycle and automobiles.
- Gymnasts apply some coarse substance on their hands to increase friction for better grip.
- Kabaddi players rub their hands with soil for a better grip of their opponents.
- Roads are made rough to prevent from slipping.
- Handle of cricket and tennis are made of rough materials to get better grip.

★ Decrease friction :-

- A few drops of oil are poured on hinges of a door, door moves smoothly.
- A bicycle and motor mechanic uses grease b/w parts of machines (reduce friction)
- By polishing surfaces, sprinkling powder on carrom board, we reduce friction.
- Wheel and ball bearings are used in machines and vehicles to reduce friction.

Q8. Explain why sportsman wear spikes?

Ans. Spikes will provide larger frictional force than normal shoes. The spikes will help in preventing the sport players from stepping on the ground. Hence sportsmen use shoes with spikes. Spikes increase the surface of the shoes and make it rough, which results in an increase in friction.

Q9. You spill a bucket of soapy ~~of~~ water on a marble floor accidentally. Would it make it easier ~~for you~~ or dif. for you to walk? Why?

Ans. It will be ~~difficult~~ for us to walk on soapy floor because the soap layer makes the floor smooth. Soapy water reduces friction and the foot cannot make a ~~grip~~ proper grip on the floor.

Q10. Can you reduce friction to zero?

Ans- Friction can never be entirely eliminated. No surface is perfectly smooth. Some irregularities are always there.

Q11. Define drag.

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Ans. The frictional force exerted by fluids is called drag or fluid friction.

Q12. What are the factors which affect the fluid friction?

Ans - Factors that determine the amount of fluid friction are:-

Nature

- Density of the fluid.
- Speed of the object.
- Shape of the object.

Q13. Two metal sheets, A and B, are rubbed with paper and sandpaper. Which one will shine more?

Ans. Metal sheet B will shine more because friction between metal sheet and sandpaper is larger than the friction between paper and metalsheet. Thus, sand paper will be able to remove the outer dull layer of metal more effectively than other.