Very Short Answer Type

Q1. Name the force which always opposes motion.
Answer:
Friction always opposes motion.

Q2. Why does a fast car slow down if its engine is switched off?
Answer:
When the engine is switched off, the fast car slow down because there is no energy available for the motion to continue.

Q3. Which type of surfaces produce
a) least friction
b) too much friction
Answer:
a) Slippery surfaces
b) Rough surfaces

Q4. What is the direction of force of friction acting on a moving object?
Answer:
The force of friction acts in the opposite direction of a moving object.

Q5. Name a device which is used to measure force acting on an object.
Answer:
Dynamometer

Q6. What is a spring balance?
Answer:
A spring balance is used for measuring the weights of objects with the help of a tension force.

Q7. Out of sliding friction, static friction, and rolling friction:
a) which one is the smallest
b) which one is the largest
Answer:
a) Rolling friction is the smallest
b) Static friction is the largest

Q8. Which type of friction comes into play when a book kept on cylindrical pencils is moved by pushing?
Answer:
Rolling friction

Q9. Why is it more difficult to walk properly on a well-polished floor?
Answer:
Because the resistance between the shoes and floor is less making it difficult to walk.

Q10. Why is it difficult to walk on a wet marble floor?
Answer:
The friction between the feet and the wet marble flood is less making it difficult to walk.

Q11. Which force is responsible for the wearing out of car tyres?
Answer:
Frictional force

Q12. What prevents you from slipping every time you take a step forward?
Answer:
Frictional force

Q13. Name the force which helps things to move and stop.
Answer:
Frictional force

Q14. What enables us to fix nails in a wall and knots to be tied?
Answer:
Friction is responsible for fixing of nails in a wall and knots to be tied.

Q15. What makes the steps of foot over-bridges at railway stations to wear out slowly?
Answer:
Frictional force

Q16. What is done to increase friction between the tyres and roads?
Answer:
The tyres have a treads to improve the grip between the tyre and the roads.

Q17. Why do gymnasts apply a coarse substance to their hands?
Answer:
To increase the frictional force between their hands and the equipment, coarse substance is applied.

Q18. Why do kabaddi players rub their hands with dry soil?
Answer:
To increase the friction they run their hands with dry soil.

Q19. Name the device which is used between the hubs and axles of bicycle wheels to reduce friction.
Answer:
Ball bearing is used.

Q20. What is the purpose of using ball bearing in machines?
Answer:
Ball bearing is used for reducing the friction between the loads and axles.

Q21. Name any two machines in which ball bearings are used.
Answer:
Car and skates

Q22. Name the device which is attached to heavy luggage to move it easily by pulling.
Answer:
Pulley

Q23. Name one example from everyday life where wheels are used to reduce friction.
Answer:
Bicycles
Q24. Why does oiling the axles of a bicycle make the bicycle move more easily?
Answer:
The friction between the axles is reduced by oiling.

Q25. State one way in which the friction between the wheel and its axle can be reduced.
Answer:
With the help of ball bearing friction can be reduced.

Q26. Name two common lubricants.
Answer:
Grease and castor oil

Q27. Why do we sprinkle fine powder on carom board?
Answer:
To reduce the friction between the striker and the board and for easy movement of coins.

Q28. Which force gets reduced when the two surfaces in contact are polished to make them smooth?
Answer:
Frictional force reduces.

Q29. Why is the surface of a slide polished to make it smooth?
Answer:
It is polished to reduce the friction.

Q30. Name the force which increase when the two surfaces in contact are made more rough.
Answer:
Frictional force

Q31. What is the special name of frictional force exerted by fluids.
Answer:
Drag is the special name.

Q32. What is the name of special shape which is given to objects moving through air to reduce drag?
Answer:
Fluid friction

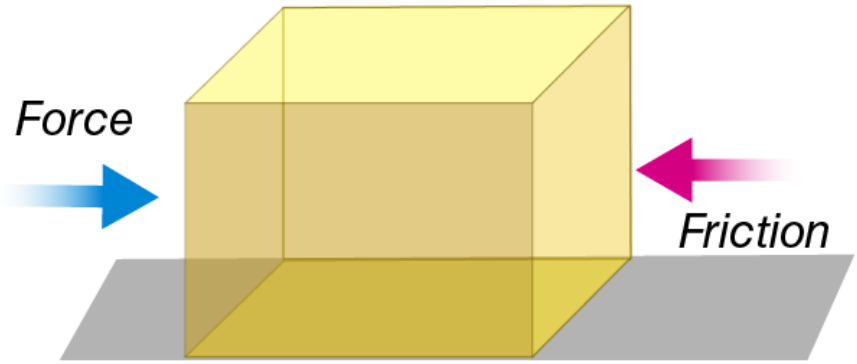
Q33. Why are grooves provided in the soles of shoes?
Answer:
Grooves increase the friction when we walk on the roads and increases the grip between the shoes and the ground.

Q34. Why are treads made in the surface of tyres?
Answer:
To increase the friction between the tyres and the ground, treads are made on the surface of the tyres.

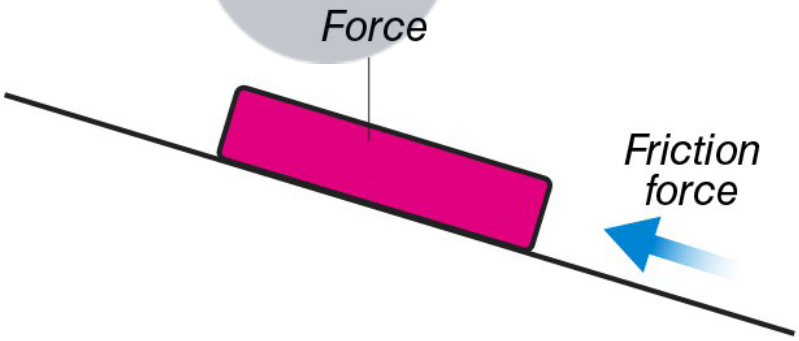
Q35. Fill in the blanks with suitable words:
a) Friction always opposes..... between the surfaces in contact with each other.
b) Sliding friction is..... than the static friction.
c) Friction produces …….
d) Friction prevents out foot from ..... over the ground.
e) Sprinkling of powder on the carom board..... friction.
f) Ball bearings reduce friction because they..... rather than slid.
g) The friction when something moves through a liquid or gas is called ……
h) Cars and speedboats are ..... to reduce drag.
i) Shapes that are designed to reduce air resistance are called .....shapes.
j) Objects which can move quickly through the water have a..... shape.
k) The shape of an aeroplane is similar to that of a ..... in flight.
Answer:
a) Motion
b) Less
c) Heat
d) Slipping
e) Reduces
f) Roll
g) Drag
h) Streamlined
i) Streamlined
j) Streamlined
k) Bird

Short Answer Type Questions

Q36. When we try to push a very heavy box kept on ground, it does not move at all. Which force is preventing this box to move forward? Where does this force act?
Answer:
When we try to push a very heavy box kept on the ground, it does not move at all because there is an opposite force acting on the box which is known as frictional force. This force acts in the opposite direction of the motion.

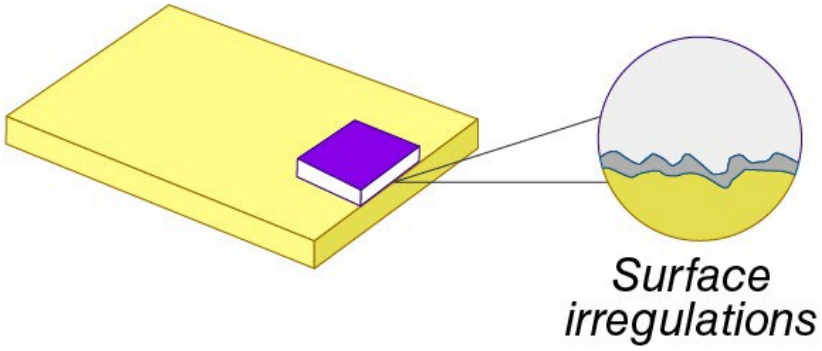


Q37. Suppose your writing table is titled a little, a book kept on the table starts sliding down. Draw a diagram to show the direction of force of friction acting on the book.
Answer:



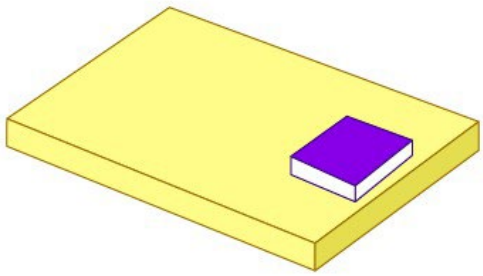
Q38. Which will cause more friction: a rough surface or a smooth surface? Why?
Answer:
A rough surface causes more friction because the irregularities on the rough surface are more when compared to the smooth surface. These irregularities helps in increasing the friction.

Q39. Explain why sliding friction is less than static friction.
Answer:
Sliding friction is less than static friction because in sliding friction the interlinking time between the two surfaces is very less. While in static friction the time duration is more.



Q40. What is meant by rolling friction?
Answer:
Rolling friction is defined as the type of friction which opposes the motion of an object when it is rolled.

Q41. Iqbal has to push a lighter box and Seema has to push a similar heavier box on the same floor. Who will have to apply a larger force and why?
Answer:
Seema has to apply a larger force as her box is heavier than Iqbal's. We know that friction is dependent on the mass of the object, here Seema's object is heavier so more force needs to applied to overcome the friction.



Q42. Why does a man slip when he steps on a banana peel thrown on the road?
Answer:
A man slips when he steps on a banana peel thrown on the road because the peel acts a lubricant which reduces the friction between the foot and the road.

Q43. Car wheels often spin on icy roads. Explain why.
Answer:
A car spins on an icy roads because the friction between the wheels and the roads is less as the surface is smooth.

Q44. Explain why
a) a pencil will write on paper but not on glass
b) climbing a greasy pole is very difficult
Answer:
a) A pencil will write on a paper but not a glass because paper offers more friction than the glass. When the graphite which is used in lead of the pencil is left behind the paper which is visible to us as words. Whereas on the glass it becomes difficult therefore, writing on glass is not easy.

b) Climbing a greasy pole is very difficult because grease acts as a lubricant which reduces the friction between the feet and the pole.

Q45. Why does a matchstick light when we strike it on a rough surface?
Answer:
A matchstick lights when it is struck against a rough surface because there is friction acting between the two surfaces. We know that friction produces heat which lightens the matchstick.

Q46. Why is it difficult to light a matchstick by striking it on a smooth surface?
Answer:
It is difficult to light a matchstick by striking it on a smooth surface because the friction offered by the smooth surface is very less.

Q47. Which parts wear away first in shoes? Give reason for your answer.
Answer:
The first part in a shoe to wear out is the sole. This is because of the friction.

Q48. Why do brake pads of bicycle have to be replaced quite often?
Answer:
The brake pads of bicycle have to be replaced quite often because they gather dust, dirt, and filthy matter. For proper functioning of the pads, they need to be replaced.

Q49. A pencil eraser loses tiny pieces of rubber each time you use it. Why does this happen?
Answer:
This happens because the surface of the paper offers friction on the eraser.

Q50. What happens when you rub your hands vigorously for a few seconds? Why does this happen?
Answer:
When we rub our hands vigorously for a few seconds, heat is produced as both the hands create friction between them.

Q51. Explain how friction enables us to walk without slipping.
Answer:

Friction helps us to walk without slipping because friction is acting between the feet and the ground. Also, force is been applied on the ground to which an opposite and equivalent force is experience by the feet.

Q52. Which is easier to hold in hand: a kulhar (earth pot) or a glass tumbler? Why?
Answer:
It is easier to hold a kulhar (earth pot) because the surface of the kulhar (earth pot) is rough making the interlocking between the hands and surface of kulhar (earth pot) easy. While the surface of the glass tumbler is smooth and there is no much grip.

Q53. How does a bicycle stop when its brakes are applied?
Answer:
When the brakes are applied, frictional force is generated between the rim of the bicycle and the brakes. Since the friction is produced in the opposite direction of the movement of the bicycle, the bicycle stops.

Q54. Explain why the soles of our shoes wear out gradually.
Answer:
The soles of our shoes wear out gradually because the ground offers friction due to which there is wear and tear of the sole.

Q55. Why do tyres of cars wear out gradually?
Answer:
The tyres of cars wear out gradually because they are always in contact with the ground and friction between the tyres and the ground results in wear out of tyres.

Q56. State two advantages and two disadvantages of friction.
Answer:

Advantages:
a) Friction makes it easy to walk
b) Friction makes it easy to write

Disadvantages:
a) Wear and tear of the tyres
b) It opposes the smooth motion of the objects

Q57. Explain why sportsman use shoes with spikes.
Answer:
Sportsman use shoes with spikes because that increases the friction between the ground and their shoes helping them run fast.

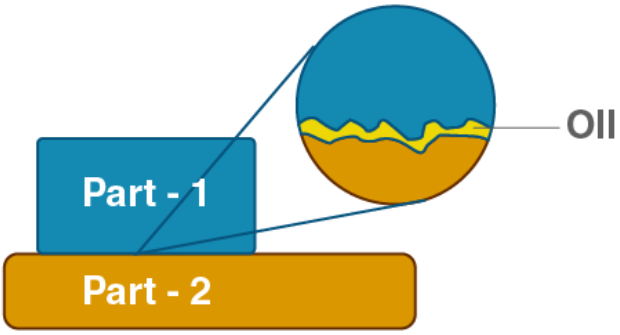
Q58. How will you reduce friction between those machine parts which rub against each other? Give the simplest method.
Answer:
The friction between the machine parts can be reduced by applying lubricants.

Q59. What is meant by lubrication? Why is it important?
Answer:
Lubrication is a process of applying additives to the parts to reduce the friction. It is important because it reduces the friction between different parts and makes working smooth.

Q60. Explain why wheels are so useful.
Answer:
Wheel are so useful because they help in transportation of heavy machines and the amount of force that is applied is also less.

Q61. Why are lubricants applied to rubbing surfaces of machines?
Answer:
Lubricants are applied to the rubbing surfaces of machines to reduce the friction between them. Also, to avoid the wear and tear of the parts.

Q62. Explain with the help of diagrams, how the use of oil reduces friction between two surfaces in contact with each other.
Answer:
Oil reduces the friction between the two surfaces in contact with each other according to the diagram that is given below:



Q63. Why are cars, aeroplanes, and rockets streamlined?
Answer:
The cars, aeroplanes, and rockets are streamlined because they move through the air and air has resistance to offer which slows down their movement. When their shape is streamlined, the drag or fluid friction is reduced.

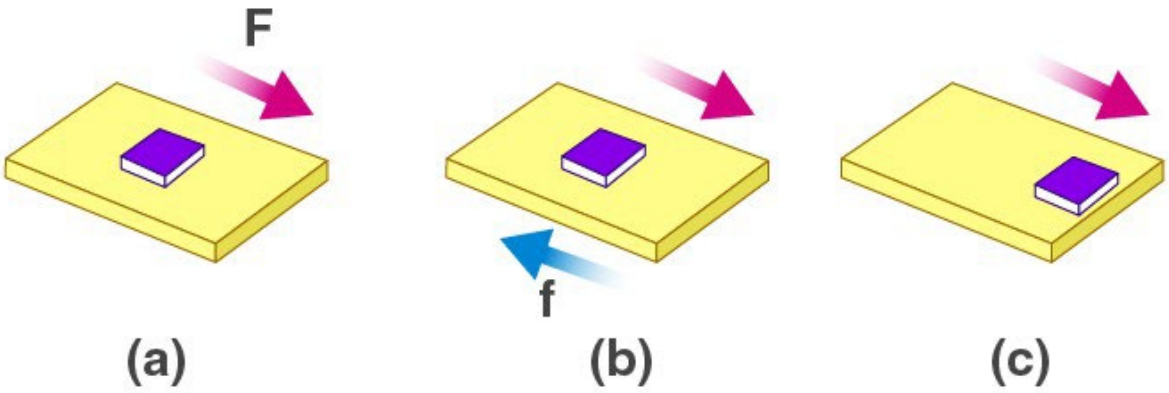
Q64. Explain why a speedboat has a streamlined shape.
Answer:
A speedboat has a streamlined shape because that reduces the fluid friction when it moves in the water.

Q65. What are fluids? Name two common fluids.
Answer:
Fluids can be either air or water which doesn't have a fixed shape. Air and blood are the fluids.

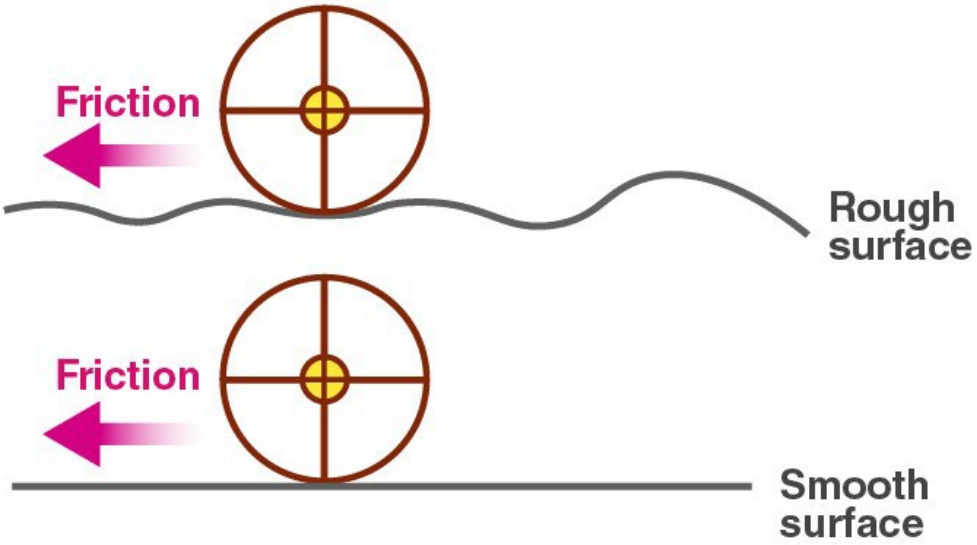
Long Answer Type Questions

Q66. a) Define friction. What are the factors affecting friction? Explain with examples.
b) What is the cause of friction? Explain with the help of a labelled diagram.
Answer:
Friction is defined as the opposing force to the motion of an object. Following are the factors that affect friction:
a) the weight of the object
b) the type of contact between the surfaces
Writing on a blackboard with a chalk is possible because friction exists between the board and the chalk.

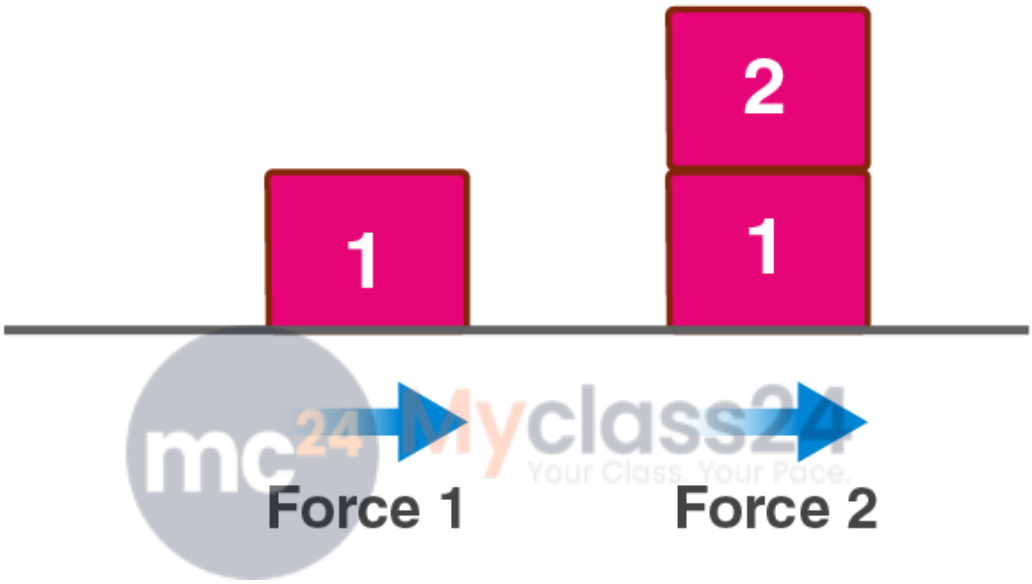
b) Surface roughness and adhesion causes the friction. Following is the diagram which explains how a book is slid over the table and how friction is produced between the book and the surface of the table.



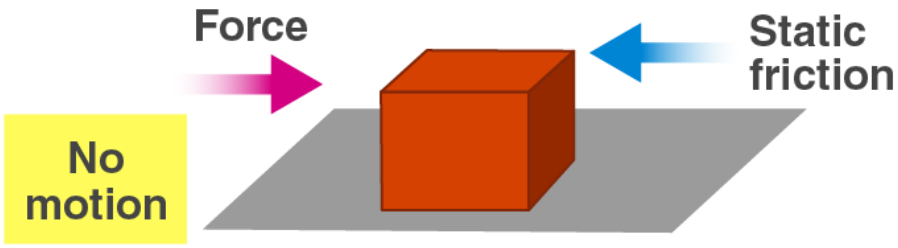
Q67. a) Give examples to show that friction depends on the nature of two surfaces in contact.
b) Give an example to show that friction depends on the force with which the two surfaces are pressed together.
Answer:
a) We know that friction depends on the roughness of the surface and the adhesion. Also, how smooth the surface is also plays a major role. When the surface is rough, the interlocking between the two surfaces becomes easy and the friction between them is also more. This makes it difficult to move the object.
When the surface is smooth, the interlocking between the two surfaces is less and the movement of object becomes easy as the friction is less.



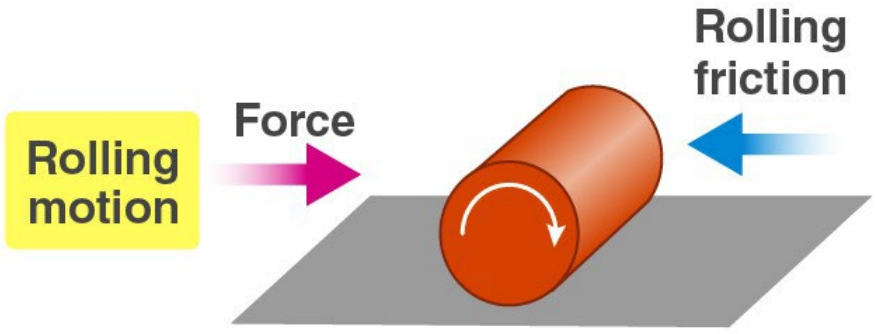
b) The friction between the two surfaces and their movement is dependent on the force which is applied on these objects. When one heavy box needs to be moved, force applied will be F1 and when the two heavy boxes needs to be pushed, the force applied will be F2. We need to understand that friction is also dependent on the mass of the object. As the mass increases, force applied will also be more which results in more friction.



Q68. a) What is the difference between static friction and sliding friction? For a given pair of objects, which of the two is greater?
b) How can a very heavy machine be moved conveniently from one place to another in a factory?
Answer:
a) Static frictional force exists when the body is at rest. Whereas sliding frictional force exists when the body is under motion.
Also, static friction is more than sliding friction because the force that is applied on the object to make the object move from rest is more.



b) With the help of the wheels, a heavy machine can be moved from one place to another. Rolling friction helps in doing this conveniently.

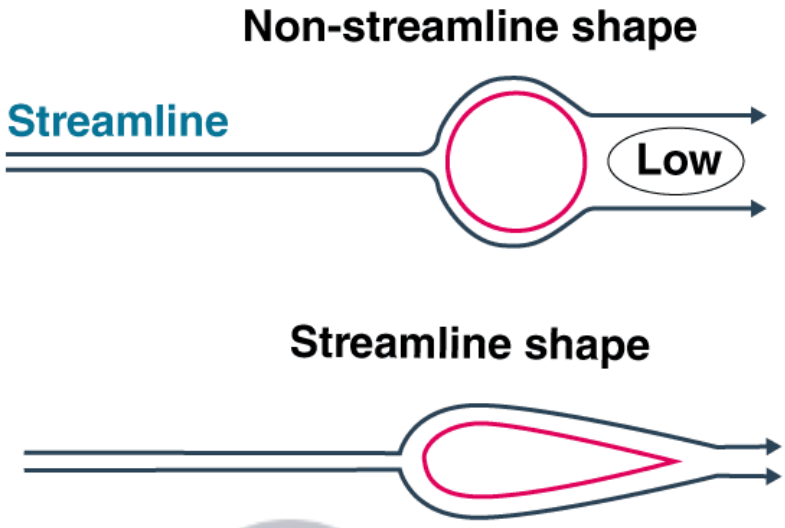


Q69. a) What is a drag? Give two examples of a drag force.
b) How can you reduce the drag on something moving through the air?
Answer:

a) Drag is also known as fluid friction which resists the motion of any object that travels through the fluid. An aeroplane moving in the sky and the ship moving in water are the two examples of drag force.

b) To reduce the drag on something moving through the air, the shape of the body should be streamlined.

Q70. a) What is meant by 'streamlined shape'? Name an object which usually has a streamlined shape.
b) Explain why objects moving in fluids should have streamlined shape.
Answer:
a) Streamlined shape means the body is pointed at the ends and the middle part of the body is broad. Speed boat is an example of streamlined shape.



b) The objects moving in fluids should have streamlined shape because that reduces the fluid friction.

Multiple Choice Questions

Q71. A boy runs his toy car on dry marble floor, wet marble floor, newspaper, and towel spread on the floor. The force of friction acting on the car on different surfaces in increasing order will be:
a) wet marble floor, dry marble floor, newspaper, towel
b) newspaper, towel, dry marble floor, wet marble floor
c) towel, newspaper, dry marble floor, wet marble floor
d) wet marble floor, dry marble floor, towel, newspaper
Answer:
The correct option is a) wet marble floor, dry marble floor, newspaper, towel

Q72. Four children were asked to arrange forces due to rolling, static, and sliding friction in a decreasing order. The correct arrangement is:
a) rolling, static, sliding
b) rolling, sliding, static
c) static, sliding, rolling
d) sliding, static, rolling
Answer:
The correct option is c) static, sliding, rolling

Q73. 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:

a) north direction

b) south direction
c) east direction
d) west direction
Answer:
The correct option is d) west direction

Q74. A spring balance can be used to measure
i) mass of an object
ii) force acting on an object
iii) density of an object
iv) weight of an object
a) i and ii
b) ii and iii
c) ii and iv
d) only iv
Answer:
The correct option is c) ii and iv

Q75. The friction between two surfaces does not depend on one of the following. This one is:
a) amount of surface area of the two objects which is in contact with each other
b) weight of the object which tends to move on the surface of other object
c) degree of smoothness of surfaces of two objects in contact with each other
d) degree of roughness of surfaces of two objects in contact with each other
Answer:
The correct option is a) amount of surface area of the two objects which is in contact with each other

Q76. If the sliding friction between two surfaces is found to be 8N, then the static friction between these two surfaces is most likely to be:
a) 5N
b) 10N
c) 4N
d) 2N
Answer:
The correct option is b) 10N

Q77. Which of the following is not an advantage of friction?
a) it enables drawing to be made on paper
b) it enables fallen things to be picked up
c) it enables rubber pads to be rubbed off
d) it enables vehicles to move on ground
Answer:
The correct option is c) it enables rubber pads to be rubbed off

Q78. Which of the following statements is incorrect?

a) static friction is greater than rolling friction

b) sliding friction is less than rolling friction
c) rolling friction is less than static friction
d) static friction is greater than sliding friction
Answer:
The correct option is d) static friction is greater than sliding friction

Q79. If the static friction between two surfaces X and Y is found to be 20N, then the rolling friction between these two surfaces should most likely be:
a) 25N
b) 20N
c) 5N
d) 50N
Answer:
The correct option is c) 5N

Q80. If the static friction between two surfaces P and Q is measured to be 50N, then the sliding friction between these two surfaces is most likely to be:
a) 75N
b) 45N
c) 55N
d) 65N
Answer:
The correct option is b) 45N

Q81. Which of the following will produce the maximum friction?
a) rubbing of sand paper on glazed paper
b) rubbing of sand paper on glass table top
c) rubbing of sand paper on aluminum frame
d) rubbing of sand paper on sand paper
Answer:
The correct option is a) rubbing of sand paper on glazed paper

Q82. Four similar cars having exactly the same mass are running at the same speed on the same road when brakes are applied at the same time. The cars come to stop after covering distances of 5m, 5.5m, 4.8m, and 5.2m respectively. The friction between the brake pads and discs will be the maximum in the car which travels the distance of:
a) 5m
b) 5.5m
c) 4.8m
d) 5.2m
Answer:
The correct option is c) 4.8m

Q83. The weight of an object can be measured by a:

a) beam balance

b) analytical balance
c) spring balance
d) physical balance
Answer:
The correct option is c) spring balance

Q84. A book is lying on the horizontal table top. If we tilt the table a little, then the book starts sliding down slowly. This happens because:
a) sliding friction is greater than static friction
b) sliding friction is less than force of gravity
c) static friction is greater than sliding friction
d) force of gravity is less than sliding friction
Answer:
The correct option is b) sliding friction is less than force of gravity

Q85. A body shape which offers very little resistance to the flow of air around it is called:
a) trimlined shape
b) steamlined shape
c) streaklined shape
d) streamlined shape
Answer:
The correct option is d) streamlined shape

Q86. Which of the following should be used to reduce friction on a carom board?
a) a lubricating oil
b) a dry lubricant
c) a layer of grease
d) a ball bearing
Answer:
The correct option is b) a dry lubricant

Q87. Which of the following does not have a streamlined shape?
a) aeroplane
b) boat
c) bird
d) bus
Answer:
The correct option is d) bus

Q88. The frictional force exerted by a fluid is called:
a) brag
b) drab
c) drag
d) tread

Answer:

The correct option is c) drag

Q89. A person has applied some mustard oil on his hands. Which of the following objects will become most difficult for him to hold in his hands?
a) earthen cup
b) thermocol tumbler
c) glass tumbler
d) wooden cup
Answer:
The correct option is c) glass tumbler

Q90. Ball bearing is a device which usually converts:
a) rolling friction into sliding friction
b) static friction into sliding friction
c) sliding friction into rolling friction
d) rolling friction into static friction
Answer:
The correct option is c) sliding friction into rolling friction