CONCEPT APPLICATION LEVEL - I [NCERT Questions]

SECTION-A

Q.1 Fill in the blanks :
(a) Friction opposes the _____ between the surfaces in contact with each other.
(b) Friction depends on the _____ of surfaces.
(c) Friction produces _____ .
(d) Sprinkling of powder on the carrom board _____ friction.
(e) Sliding friction is _____ than the static friction.

Ans. (a) relative motion (b) nature (c) heat (d) reduces (e) less

Q.2 Four children were asked to arrange forces due to rolling, static and sliding friction in a decreasing order. Their arrangements are given below. Choose the correct arrangement :
(A) rolling, static, sliding **(B) rolling, sliding, static**
(C) static, sliding, rolling **(D) sliding, static, rolling**

Ans. (C) static, sliding, rolling

Q.3 Alida runs her toy car on a 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

Ans. (A) wet marble floor, dry marble floor, newspaper, towel

Q.4 Suppose your writing desk is tilted a little, a book kept on it starts sliding down. Show the direction of frictional force acting on it.

Ans. The book moves downwards. The frictional force is acting opposite to the movement of book. So it acts upwards.

Q.5 You spill a bucket of soapy water on a marble floor accidently. Would it make it easier or more difficult for you to walk on the floor ? Why ?

Ans. The layer of soap makes floor smooth due to which the friction is reduced and the foot cannot make a proper grip on the floor. Therefore it is difficult to walk on a soapy floor and we start to slip.

Q.6 Explain why sportsmen use shoes with spikes.

Ans. Sportsment use shoes with spikes to increase the friction between shoes and the surface. The shoes with spikes do not slip while they run or play.

Q.7 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 ?

Ans. The heavy object will be pressed hard against the opposite surface and produces more friction. So Seema a will have to apply a larger force due to more friction.

Q.8 Explain why sliding friction is less than static friction.

Ans. The two sliding objects find less time to get interlocked against each other (objects and irregularities of surface). So they get less friction. Therefore sliding friction is always less than the static friction.

Q.9 Give examples to show that friction is both a friend and a foe.

Ans. Examples to show that friction is a friend and a foe :

Friction is a friend

(i) Friction allows us to grip and catch different objects.
(ii) It helps us to walk comfortably on the surface.
(iii) It helps to minimise the speed or to stop the moving objects.
(iv) It helps to write on paper and blackboard.
(v) The things do not move from their place due to the friction between the surfaces.

Friction is a foe :

(i) Friction causes wear and tear in objects.
(ii) It causes damage to the parts of machines.
(iii) The machines or tools require regular maintenance due to which a lot of money is wasted.
(iv) It reduces the speed of moving objects, so more force is required.
(v) It does not allows the free movement of objects.

Q.10 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.

SECTION-B

- **FILL IN THE BLANKS**

Q.1 The friction always _____ the direction of motion .
Q.2 Friction also produces _____ .
Q.3 All objects moving in fluids have _____ shape to reduce friction.
Q.4 Smooth surfaces produce _____ friction than rough surfaces.
Q.5 The substances used in machines to protect their surfaces from wear and tear caused by friction are called _____ .
Q.6 An air cushion between the moving parts is used to _____ friction.
Q.7 Friction can never be entirely _____ .
Q.8 Birds and fishes have _____ shaped body.
Q.9 We pour a drop of oil on the hinges of door to _____ friction.

- **TRUE/FALSE (Write True / False against each statement)**

Q.1 Friction always works in opposite direction of motion of the surface.
Q.2 Irregularities between two surfaces interlock to produce friction.
Q.3 Friction increases with increase in the smoothness of the surface
Q.4 Soapy floor is slippery due to increased friction.
Q.5 Friction is a necessary evil.
Q.6 Spring balance is a device used for measuring the force:.
Q.7 Sportsmen use shoes with spikes to increase the friction.
Q.8 Smooth surface has less frictional force.
Q.9 Fluids are only liquids.
Q.10 Friction is always harmful for us.

SECTION-C

- **MULTIPLE CHOICE QUESTION WITH ONE CORRECT ANSWERS**

Q.1 A force that opposes the motion of one surface sliding over another is called
(A) lubrication (B) ball bearing (C) friction (D) polishing

Q.2 Ball bearings are used to
(A) decrease friction (B) decrease surface area
(C) increase friction (D) increase surface area

Q.3 Lubricants are used to
(A) reduce friction (B) increases friction (C) make a surface oily (D) make a surface shiny

Q.4 Friction can be increased by
(A) making the surface rough (B) increasing the mass of object
(C) both (A) and (B) (D) None of these

Q.5 When a bicycle travels on a rough surface, its speed
(A) increases (B) decreases (C) remains the same (D) None of these

Q.6 The use of lubricants makes the surface
(A) smooth (B) rough (C) very rough (D) hard

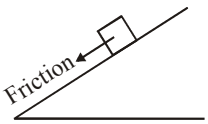
Q.7 The frictional force _____ with the _____ in roughness of the surfaces.
(A) increases, decrease (B) decreases, decrease
(C) increases, increase (D) Both (B) and (C)

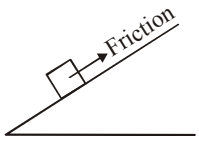
Q.8 The maximum force of friction, when the body just begins to move is known as the
(A) limiting friction (B) rolling friction (C) static fiction (D) dynamic friction

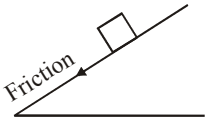
Q.9 The friction that exists between a surface sliding on another surface is called the
(A) dynamic friction (B) rolling friction (C) static friction (D) limiting friction

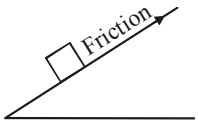
Q.10 The special shape of the body due to which it experiences least fluid friction is called
(A) streamlining (B) friction (C) buoyancy (D) upthrust

Q.11 Suppose you writing desk is tilted a little. A book kept on it, starts sliding down. The figure, showing the correct direction of frictional force acting on it, is

(A) 

(B) 

(C) 

(D) 

Q.12 Friction, that exists between two surfaces in contact, when there is no relative motion between them, is called
(A) sliding friction (B) static friction (C) viscous drag (D) rolling friction

Q.13 The energy required to overcome friction is mainly converted into
(A) sound energy (B) heat energy (C) light energy (D) chemical energy

Q.14 Out of the following, the better lubricant to be used in the moving parts of machine, is
(A) water (B) air (C) chalk powder (D) turpentine oil

Q.15 Force of friction is more in
(A) marble tiles (B) wooden floor (C) playground (D) glass table

Q.16 Once a body starts moving on table, the friction which comes into play is
(A) static friction (B) sliding friction
(C) limiting friction (D) None of these

Q.17 The force of friction that comes into play when one body rolls over another surface, is
(A) sliding friction (B) limiting friction
(C) rolling friction (D) static friction

Q.18 These days we use suitcases with wheels because
(A) they look smart (B) they are easy to carry
(C) they make less noise (D) none of these

Q.19 Tyres have cut grooves in them
(A) to increase friction (B) to decreases friction
(C) to make them look attractive (D) to save rubber

Q.20 Why we use circular tyres
(A) They require less material (B) Rolling friction is smaller than sliding friction
(C) It is easy to inflate the circular tyres (D) Due to some season other than these listed above

Q.21 1 m^2 area is equal to:
(A) 100 cm^2 (B) 1000 cm^3 (C) 10000 cm^2 (D) 10^{-4} cm^2

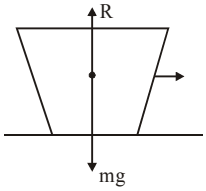
Q.22 Type of contact forces can be
(A) Tension force (B) Normal force (C) Muscular force (D) All of these

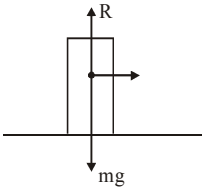
Q.23 When we apply a small force on an object placed on a rough table such that object does not moves at all than the kind of friction force between object and table is
(A) kinetic friction
(B) rolling friction
(C) both rolling and kinetic friction
(D) neither rolling nor kinetic friction

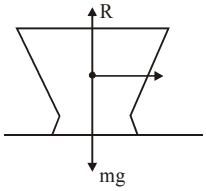
Q.24 A friction cannot act through
(A) empty space (B) touching
(C) touching with metal rod (D) touching with a wooden rod

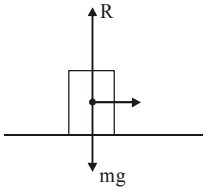
Q.25 A force that opposes the motion of one surface sliding over another is called
(A) friction (B) newton (C) Lubrication (D) fall bearing

Q.26 What can be inferred regarding the frictional force in the following figures.

(I) 

(II) 

(III) 

(IV) 

(A) $F_I = F_{II} = F_{III} = F_{IV}$ (B) $F_I > F_{II} > F_{III} > F_{IV}$
(C) $F_I < F_{II} < F_{III} < F_{IV}$ (D) $F_I = F_{II} < F_{III} < F_{IV}$

Q.27 Which of the following is correct option for two surfaces in contact?
(A) Sliding friction is more than rolling friction (B) Rolling friction is more than sliding friction
(C) Sliding friction is equal to rolling friction (D) None of these

Q.28 SI unit of friction force is
(A) m/s (B) metre (C) newton (D) second

Q.29 An object that is moving with uniform velocity is said to be in:
(A) rest (B) motion (C) limiting friction (D) none of these

Q.30 A ball thrown on ground stops after some time due to:
(A) frictional force (B) mass of the ball
(C) size of the ball (D) none of these

SECTION-D

- **MATCH THE FOLLOWING (ONE TO ONE)**

Match the items given in Column A with those in Column B suitably:

Q.1

	Column A		**Column B**
(i)	Lubricants	(a)	Heat
(ii)	Friction produces	(b)	Rolling friction
(iii)	Wheels	(c)	Less the friction
(iv)	Ball bearings	(d)	Oil and grease
(v)	Soapy floor	(e)	Ceiling fan

Q.2

Column A		**Column B**	
(i)	Spring balance	(a	Nature of surface
(ii)	Lubricants	(b)	Drag
(iii)	Fluid friction	(c)	Reduce friction
(iv)	Shape of aeroplane	(d)	Measuring force
(v)	Friction	(e)	Stream lined