Q1:Part A:

SOLUTION:

Given Data:

Mass of a body m = 1kg

Change of velocity v = 4 m/s

Time t = 4s

Required:

Force f =?

Force = mass*acceleration

F=ma

Now first we can find the acceleration

Acceleration = velocity/time

Putting the values

A =4/4

A= $1\ m/s^2$

Now putting the values in formula of force

F =ma

F = 1×1

$F = 1$ N (Answer)

Q1 Part b:

Solution:

Given data: Force F= 1200N

Area A= $10cm^2$=$10 \times 10^{-4} m^2$=$10^{-3}\ m^2$

Required :

Thrust pressure

And pressure of the surface

We know that

Thrust=normal pressure=F=1200N

Pressure P=force /area

Putting the values

P=1200/10^{-3} m^2

P=1.2× 10^6Nm^2(Answer)

Q2: part A

Answer:

- **Equilibrium:**

A state of balance or a stable situation where opposing forces cancel each other out and where no changes are occurring. an example of equilibrium is in economics when supply and demand are equal. or when hot air and cold air are entering in the room at the same time so the temperature will be not change.

There are two condition of equilibrium:

First condition:

The first condition of equilibrium is that the net force in the all directions must be zero.

∑F=0

Second condition:

The second condition of equilibrium is that the net torque acting on the object must be zero.

∑t=0.

Q2 part B:

Answer:

Difference between stable and unstable equilibrium:

S.No	Stable equilibrium	Unstable equilibrium
1.	F net=0	F net=0
2.	When displaced from its equilibrium position, a net restoring force starts acting on the body which has a tendency to bring body back to its equilibrium position.	When displaced from its equilibrium position, a net force starts acting on the body in the direction of displacement or away from the equilibrium position.
3.	When displaced from equilibrium position the centre of gravity of the body goes up.	When displaced from equilibrium position the centre of gravity of the body remains at the same level.

Q3:

Answer:

- **Force:**

In science, force is the push or pull on an object with mass that causes it to change velocity (to accelerate). Force is vector quantity. Which have magnitude and direction. Force is denoted by F.

Formula of force, F=ma.

Example:

- An moving bike stops when brakes are applied. For a moving bike to stop, force must be used.
- A bull is pulling the cart due with force.

- **Gravity force:**

Gravity is a force which tires to pull two objects toward each other. anything which has a mass also has a gravitational pull. the more massive an object is, the stronger its gravitational pull is earth's gravity is what keeps you on the earth.

Example:

- The force that holds the gases in the sun.
- The force that causes a ball you throw in the air to come down.
- The force that causes a glass you drop to fall to the floor.

- **Friction force:**

The force required to initiate or to maintain relative motion against friction. Friction is the force resisting the relative motion of solid surfaces, fluid layers, and material elements sliding against each other. the force that resist motion when the surface of one object comes in the contact with the surface of another.

Formula of friction force $f=\mu N$

Example:

- Rubbing both hands together to create heat.
- A person sliding down a slide is an example of sliding friction.
- An iron being pushed across material.

- **Spring force:**

The spring force is the force exerted by a compressed or stretched spring upon any object that attached to it. Stretched a spring is always acted upon by a force that restores the object to its rest or equilibrium position.

Spring force $Fs=kx$

- **Tension force**:

The force that transmitted through a rope, or wire when pulled by forces acting from opposite sides. The tension force is directed over the length of the wire and pulls energy equally on the bodies at the ends.

Tension(Ft)= force of gravity (Fg)= $m \times g$.

Example:

- Lefts in the shopping moles.