

Assignment

Course title: Basic Mechanical

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Q1: (a) A body of mass 1 kg undergoes a change of velocity of 4 m/s. What is the force acting on it?

Ans-

Given data = $M = 1 \text{ kg}$

$\Delta V = 4 \text{ m/s}$

Required data = $F = ?$

Solution

$a = \text{change in velocity} = \Delta V = 4 \text{ m/s}$

We know that

$$F = ma$$

Putting values

$$F = (1)(4)$$

$$F = 4 \text{ N}$$



Q1: (b) A force of 1200 N acts on the surface of area 10 cm^2 normally. What would be the thrust and pressure on the surface?

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Ans:

Given data = $F = 1200\text{ N}$ $A = 10\text{ cm}^2$ Required data = $p = ?$

Solution

We know that

$$P = \frac{F}{A}$$

Putting the values

$$P = \frac{1200\text{ N}}{10 \times 10^{-4}\text{ m}^2}$$

$$P = \frac{1200\text{ N}}{10 \times 10^{-4}\text{ m}^2}$$

$$P = 1.20 \times 10^6 \text{ Pascal}$$

$$P = 1.2 \times 10^6 \text{ Pascal}$$



Q2: (a) Define Equilibrium and its conditions?

Ans: **Equilibrium:**

When the body is in state or moving with uniform velocity the body is the state of equilibrium.

OR

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When all the net forces and torque acting on the body is zero then the body is said to be in equilibrium state.

Conditions:

$$(i) \Sigma F = 0$$

$$(ii) \Sigma T = 0$$

(i) Sum of forces acting on a body is zero

(ii) Sum of torque acting on a body is zero.



Q2: (b) Differentiate between stable and unstable Equilibrium and give proper examples you will observe in daily life?

Ans: (i) Stable equilibrium:

The body is said to be in a stable equilibrium if it come to the original position.

(ii): UNstable equilibrium:

The body is said to be unstable equilibrium if the body come to equilibrium rather than its original position.

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Examples:

(1)



Suppose this is a plate having a ball if we disturb the ball after sometime the ball come to equilibrium to its original position this is known as stable equilibrium.

(2)



Now the ball on the ground if we disturb the ball after some time the ball come to the equilibrium but not to its original position this is known as unstable equilibrium.



Q3: (a) Define the following terms and give daily life examples?

- Force
- Gravity force
- Friction force
- Spring force
- Tension force.

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Ans: • **Force:**

Force is an agent which change the position of the body.

example:- • Opening or closing a door.

• Pushing a wheel barrow.

• Squeezing wet clothes.

• **Gravity force:**

It is the force on which earth attract everthing towards its center.

Example:- • The force that causes a ball you throw in the air to come down again.

• The force that causes a car to coast downhill even when you aren't stepping on the gas.

• **Friction force:**

It is the force that opposes the motion of object due to contact.

Example:- • Rubbing both hands together to create heat.

• skis sliding against snow.

• A washing machine pushed along a floor.

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• Spring force:

The force which keep object away or hold.

Example: A spring is a metal elastic device that returns to its original form when pulled or pressed if the spring is stretched spring force is attractive, if it is compressed. Spring force is repulsive.

other example: Trampoline, diving board etc.

• Tension force:

The force which prevent body from falling is called Tension force.

Example: • Pulling on a rope.

- A car towing another car with a chain.

