26 April 2020

S.3 WORK ABOUT PRESSURE.

1. A cuboid of mass 4kg with dimension 2m x1mx4m. Find the minimum and maximum pressure it exerts on the ground.
2. Determine the maximum pressure that can be exerted by a cuboid of mass 48kg with dimensions 1m by 2m by 4m on the floor it is rising.
3. Determine the minimum pressure that can be exerted by a cuboid with dimensions 1cmx2cmx 3cm given its mass is 60g.
4. A cuboid has dimensions 2cm x1cmx4cm and mass 32g. Determine the maximum and minimum pressure it can exert on the ground.
5. (a) A book of mass 40kg and of dimensions 2m by 5m by 10m is resting on the ground. Calculate the maximum pressure exerted when resting the ground.

   (b) The 4 tyres of a car are blown up to a pressure 180 kN m^{-2}. If the area of all the 4tyres in contact with the road is 0.05m2. What is the weight of the car?

   (c) If the box is filled with water to a height of 8m. Calculate its pressure exerted on the ground.
6. A rectangular block of dimensions 4m x 2m x 1m exerts maximum pressure of 200Nm^{-2} when resting on a table. Calculate the mass of the block
7. A car of mass 800 kg is standing on a road. If each tyre has an area of 250 cm^2 in contact with the road, what pressure in N cm^{-2} does the car exert on the road?
8. The mass of a cuboid whose dimensions are 4 m x 3 m x 2 m is 48 kg. Calculate the minimum pressure it can exert on the surface.
9. A force of 20 kN is acting on an area of 4.0 x 10^{-2} m^2. What is the pressure exerted.
10. A wooden block of dimensions 8 cm × 10 cm × 12 cm has a weight of 12 N. On which side should the wooden block be placed to produce a maximum pressure exerted on the table. What is value of this pressure?
11. A student pressing a thumbtack into a piece of wood with a force of 20 N. The surface area of the head of the thumbtack is 1 cm^{-2} and the cross-sectional area of the tip of the thumbtack is 0.01 cm^{-2} Calculate:

    (a) The pressure exerted by the student's thumb on the head of the thumbtack

    (b) The pressure of the tip of the thumbtack on the wood.

    (c) What conclusion can be drawn from your answers?

26 April 2020

12. A block of metal of dimensions 0.5 m x 0.6 m x 1.0 m has a mass of 300 kg. Calculate the maximum pressure acting on the ground.