JUNE 2016

7. A lift, starting from rest, descends with a uniform acceleration of $3.2\,ms^{-2}$ until it reaches a speed of $12\,ms^{-1}$. It then travels at a constant speed of $12\,ms^{-1}$ for a short time and finally, it is brought to rest with a uniform deceleration of $2.4\,ms^{-2}$. A person of mass 65 kg is standing in the lift. Calculate the magnitude of the reaction of the floor of the lift on the person during each of the three stages of the motion. [5]

JAN 2014

8. A man of mass 65 kg stands in a lift which is ascending with acceleration $1.2\,ms^{-2}$. Find the magnitude of the reaction of the floor of the lift on the man. [3]

9. A crate of mass 25 kg rests on the floor of a lift, which is descending. Find the reaction of the floor of the lift on the crate when

JUNE 2014

   (a)   the acceleration of the lift is $1.2\,ms^{-2}$, [3]

   (b)   the velocity of the lift is constant. [1]

JUNE 2015

10. A man of mass M kg stands on the floor of a lift which is ascending with constant acceleration of $0.2\,ms^{-2}$. The reaction of the floor of the lift on the man is 680 N. The mass of the lift is 1800 kg. Determine the value of M and the tension in the lift cable. [6]

11.

M1

June 2001

Bathroom scales show a reading of x kilograms when a downward force of xg newtons acts on the scales. An object is placed on a bathroom scale on the floor of a lift. The lift is descending.

   (a)   When the lift is accelerating downwards at $0.7\,ms^{-2}$, the reading on the scale is 13 kg. Calculate the mass of the object. [4]

   (b)   Determine the reading on the scale when

      (i)   the lift is moving at a constant speed of $2.8\,ms^{-1}$,

      (ii)   the retardation of the lift is $1.4\,ms^{-2}$. [5]

JUNE 2006

12. A lift, starting from rest, descends with a uniform acceleration of $3\,ms^{-2}$ until it reaches a speed of $9\,ms^{-1}$. It then travels at a constant speed of $9\,ms^{-1}$ for a short time and finally, it is brought to rest with a uniform retardation of $2\,ms^{-2}$. An object, of mass 6 kg, is on the floor of the lift. Calculate the magnitude of the reaction of the floor on the object during each of the three stages of the motion. [5]

13. When a lift is descending with acceleration a ms^{-2}, the tension in the lift cable is 11 625 N. The total mass of the lift and its contents is 1250 kg.

JUNE 2005

M1

   (a)   Find the value of a. [3]

   (b)   A crate on the floor of the lift has a mass of 200 kg. Find the magnitude of the reaction of the floor on the crate. [2]

14.
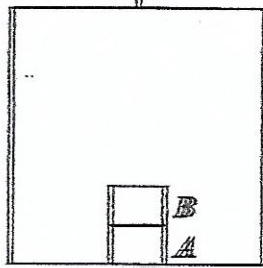
The diagram shows a lift of mass 750 kg carrying two crates A and B stacked one on top of the other. The masses of A and B are 500 kg and 100 kg respectively.

(a) Given that the lift has an upward acceleration of 2 ms^{-2}, find the tension in the lift cable.

[3]

(b) Given that the lift has a downward acceleration of 3 ms^{-2}, find the reaction between the two crates.

[3]