Year 1 Applied Chapter: Forces and Motion – Scale Pans
Exam Questions (Total Marks 19)

Q1.

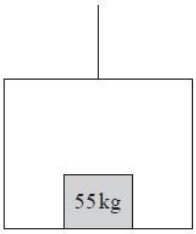

Figure 2

A lift of mass 200 kg is being lowered into a mineshaft by a vertical cable attached to the top of the lift. A crate of mass 55 kg is on the floor inside the lift, as shown in Figure 2. The lift descends vertically with constant acceleration. There is a constant upwards resistance of magnitude 150 N on the lift. The crate experiences a constant normal reaction of magnitude 473 N from the floor of the lift.

(a) Find the acceleration of the lift.

(3)

(b) Find the magnitude of the force exerted on the lift by the cable.

(4)

(Total for question = 7 marks)

Q2.

A woman travels in a lift. The mass of the woman is 50 kg and the mass of the lift is 950 kg. The lift is being raised vertically by a vertical cable which is attached to the top of the lift. The lift is moving upwards and has constant deceleration of 2 m s^{-2}. By modelling the cable as being light and inextensible, find

(a) the tension in the cable,

(3)

(b) the magnitude of the force exerted on the woman by the floor of the lift.

(3)

(Total 6 marks)

Q3.

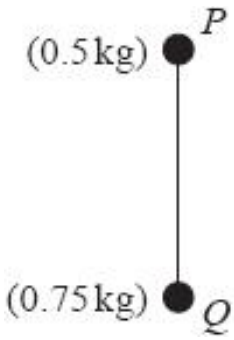

Figure 2

A vertical light rod *PQ* has a particle of mass 0.5kg attached to it at *P* and a particle of mass 0.75kg attached to it at *Q*, to form a system, as shown in Figure 2. The system is accelerated vertically upwards by a vertical force of magnitude 15N applied to the particle at *Q*. Find the thrust in the rod.

(6)

(Total for question = 6 marks)