$$RF = ma \quad \text{with} \quad \text{LIFTS} : \text{EXAM} \ 1$$

1. *(a)* A lift, of mass 1200 kg, is moving upwards. Find the tension in the lift cable when the lift is moving with

JUNE 2018

(i) an acceleration of 2 ms⁻²,

(ii) constant speed.

[4]

(b) A person of mass M kg stands in a lift which is moving downwards with an acceleration of 3 ms⁻². The reaction of the floor of the lift on the person is 442 N. Determine the value of M.

[3]

2. A crate, of mass 80 kg, lies on the floor of a lift. Find the reaction of the floor of the lift on the crate when

JAN 2011

(a) the lift is moving down with acceleration 0·3 ms⁻², [3]

(b) the lift is moving up with acceleration 0·2 ms⁻², [3]

(c) the lift is moving up with constant speed. [1]

3. A lift of mass 2500 kg is ascending with an acceleration of 1·8 ms⁻².

JUNE 2012

(a) Calculate the tension in the lift cable. [3]

(b) A person of mass M kg stands on the floor of the lift. Given that the magnitude of the reaction of the floor of the lift on the person is 696 N, find the value of M. [3]

4. A person, of mass 60 kg, is standing in a lift, which is of mass 540 kg. When the lift is accelerating upwards at a constant rate of a ms⁻², the tension in the lift cable is 6600 N.

JUNE 2011

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

(b) Find the reaction between the person and the floor of the lift. [3]

5. *(a)* When a lift is ascending with an acceleration of a ms⁻², the tension in the lift cable is 15 000 N. The total mass of the lift and its contents is 1200 kg. Determine the value of a. [3]

JUNE 2017

(b) A crate on the floor of another lift has mass 50 kg. The lift is descending with an acceleration of 0·2 ms⁻². Find the magnitude of the reaction of the floor on the crate. [3]

6. A person of mass 64 kg is standing in a lift which is of mass M kg. When the lift is accelerating downwards at a constant rate of 0·425 ms⁻², the tension in the lift cable is 7500 N.

JUNE 2013

(a) Calculate the value of M. [3]

(b) Find the reaction between the person and the floor of the lift. [3]