**Name of the Student**:_____

**Max. Marks : 20 Marks**                                    **Time : 20 Minutes**

Q1.

A car has a mass of 1200 kg.

Calculate the force needed to give this car an acceleration of 2.4 m / s$^2$ .

(2)

Use the equation

$$F = m \times a$$

force = ............................................................ N

**(Total for question = 2 marks)**

Q2.

A car with a mass of 1800 kg is accelerating at 1.2 m/s$^2$.

Calculate the force used to accelerate the car.

Use the equation

force = mass × acceleration

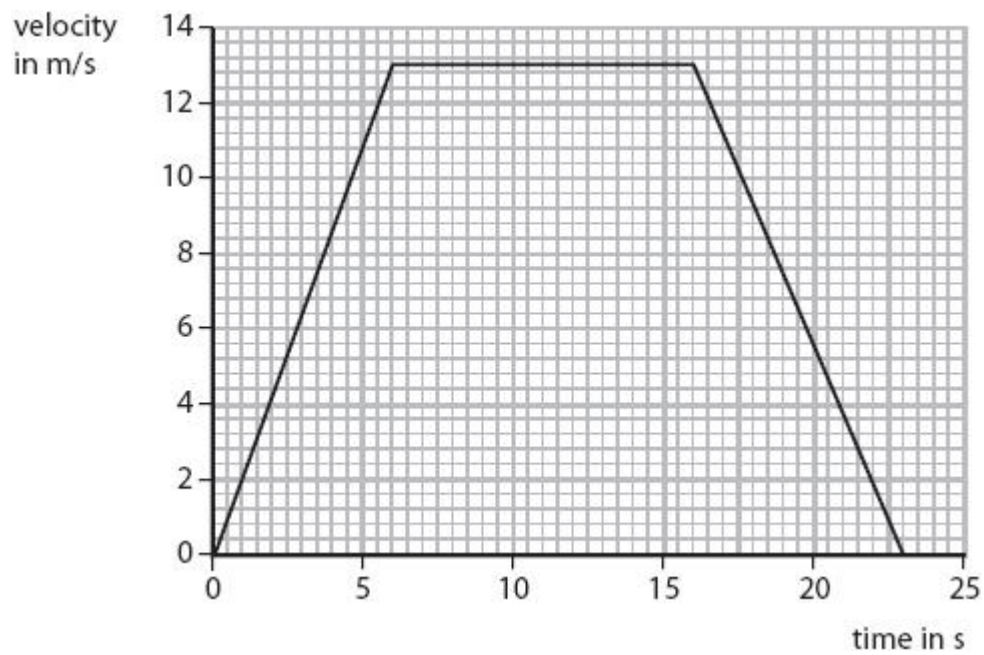(2)

force = .......................................................... N

**(Total for question = 2 marks)**

Q3.

Figure 7 is a velocity-time graph for the motion of a van on a long, straight road.



**Figure 7**

(i) The van accelerates at 2.2 m/s$^2$.

The force causing this acceleration is 5.5 kN.
Calculate the mass of the van.

**(3)**

mass = .......................................................... kg

(ii) Calculate the distance travelled by the van between 16.0 s and 23.0 s.

Give your answer correct to 2 significant figures.

**(4)**

distance travelled = .......................................................... m

**(Total for question = 7 marks)**

Q4.

A motorcycle is travelling at a velocity of 6.2 m/s.

The motorcycle accelerates at 2.5 m/s$^2$ until its velocity is 10 m/s.

(i) Calculate the time taken for this acceleration.

Use the equation

$$\text{time taken} = \frac{\text{change in velocity}}{\text{acceleration}}$$

(2)

time taken = ........................................................... s

(ii) The motorcycle now decelerates (slows down) from 10 m/s to a stop.

The deceleration is at a constant rate of 4.4 m/s$^2$ .
Calculate the distance the motorcycle travels as it slows down to a stop.
Use the equation

$$v^2 - u^2 = 2 \times a \times x$$

distance = ........................................................... m

**(Total for question = 2 marks)**

Q5.

Quantities can be either scalar or vector.

The ball bearing is now dropped through air.

The initial velocity of the ball bearing is zero.

The acceleration of the ball bearing is 10 m/s$^2$.

The ball bearing falls 1.5 m.

Calculate the velocity of the ball bearing when it has fallen 1.5 m.

Use the equation

$$v^2 - u^2 = 2 \times a \times x$$

(2)

velocity of ball bearing = ......................................................... m/s

**(Total for question = 2 marks)**

Q6.

A rock on the surface of the Earth has a mass of 12 kg.

(i) Calculate the weight of this rock on the surface of the Earth.
The gravitational field strength on the surface of the Earth is 10 N/kg.
Use the equation

$$W = m \times g$$

(2)

weight on the Earth = ........................................................... N

(ii) The weight of the same rock on the surface of the Moon is 20 N.
Calculate the gravitational field strength on the surface of the Moon.

(3)

gravitational field strength on the Moon ........................................................... N/kg

**(Total for question = 5 marks)**