Prior Knowledge Review Markscheme

1. State the definition of:
   a. A force

An interaction between two objects.

   b. Balanced forces

Forces that are equal in magnitude and opposite in direction that produce a zero resultant force.

   c. Resultant force

The net force acting on an object, or the overall effect of all the forces acting on an object.

   d. Contact force

Forces that act by direct contact on objects, e.g. friction.

   e. Non-contact force

Forces that act at a distance, e.g. magnetism.

   f. Friction

A force that opposes motion which is caused by the interaction of surfaces moving over one another.

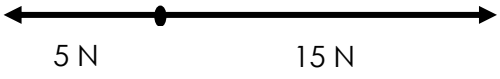
   g. Mass

The amount of matter contained in an object, measured in kg.

   h. Weight

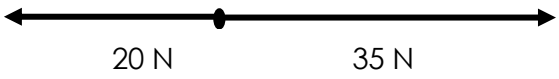
The force of gravity acting on a mass, measured in N.

2. State whether the following pairs of forces are balanced or unbalanced and calculate the resultant force in each case:
   a.



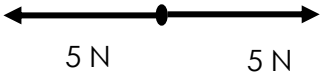
Unbalanced, Resultant force = 10 N right

   b.



Unbalanced, Resultant force = 15 N right

c.



Balanced, Resultant force = 0 N

d.

Unbalanced, Resultant force = 65 N left

3. Objects have different weights in different parts of the solar system.

a. State the equation used to calculate weight.

W = m x g

b. Complete the following table to show the masses and weights of objects in different parts of the solar system:

Take the gravitational field strength of the Moon as 1.6 N/kg.

Mass	**Weight on Earth**	**Weight on the Moon**
50 kg	**500 N**	**80 N**
80 kg	800 N	**128 N**
30 kg	**300 N**	48 N

4.

a. State the definition of speed.

How much distance is covered in a given time.

b. State the equation used to calculate speed with the SI units for each quantity.

$$\text{Speed (m/s)} = \frac{\text{Distance (m)}}{\text{Time (s)}}$$

c. Calculate the speed of a person who runs a 200 m race in 25 seconds.

$$\text{Speed} = \frac{\text{Distance}}{\text{Time}}$$

$$\text{Speed} = \frac{200\text{ m}}{25\text{ s}}$$

Speed = 8 m/s

d. Calculate how long it takes a car to drive 1000 m at 20 m/s.

Speed = Distance / Time
20 m/s = 1000 m / time
Time = 1000 m/20 m/s
Time = 50 s

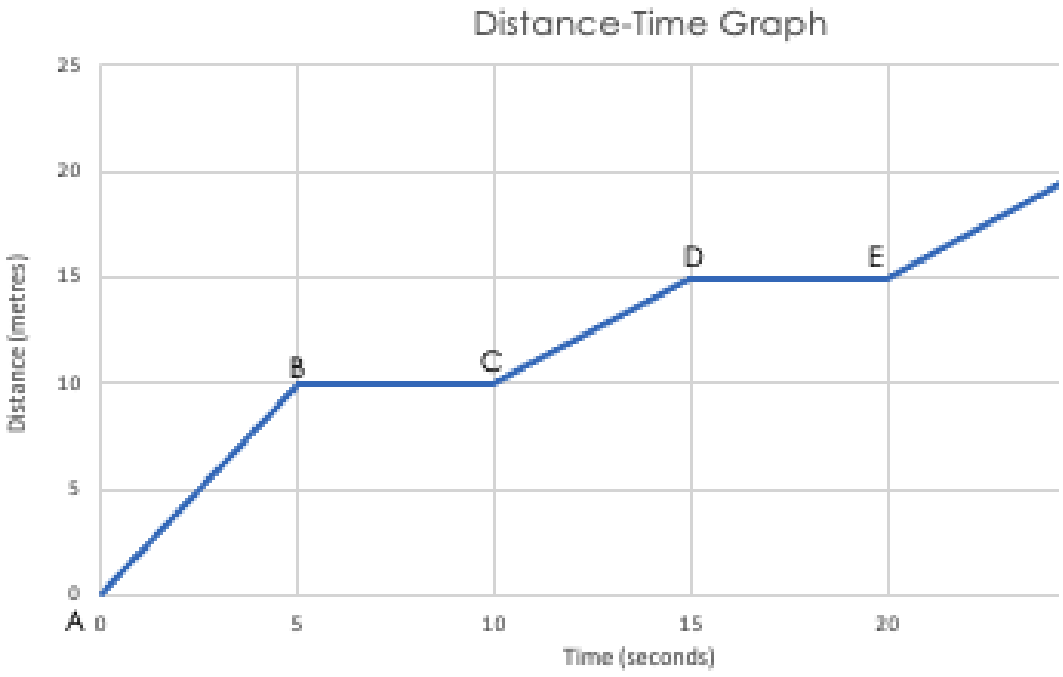
e. Calculate how far a cyclist can travel in 1 minute at 15 m/s.

Speed = Distance / Time
15 m/s = Distance / 60 s
Distance = 15 m/s x 60 s
Distance = 900m

f. Calculate how fast an aeroplane is travelling if it covers 3 km in 12 seconds.

Speed = Distance / Time
Speed = 3000 m / 12 s
Speed = 250 m/s

5. Use the following distance-time graph to answer the questions below:



a. Between which points in the graph is the object stationary?

B-C and D-E

b. Between which points in the graph does the object have the greatest speed?

A-B (slope is the steepest)

c. Describe the motion during each stage of this journey

i. A-B: **constant speed**

ii. B-C: **stationary**

iii. C-D: **constant slower speed**

iv. D-E: **stationary**

v. E-F: **constant speed (same speed as C-D)**