

Name of the Student: _____

Max. Marks : 16 Marks

Time : 16 Minutes

Mark Schemes

Q1.

Question number	Answer	Additional guidance	Mark
(i)	<p>An explanation that combines identification – application of knowledge (1 mark) and reasoning/justification – application of understanding (1 mark):</p> <ul style="list-style-type: none"> frictional forces increase as more trucks are added (1) <p>Plus one from:</p> <ul style="list-style-type: none"> hence, in order to keep constant speed, the student must increase the force she applies to Z (1) when Y and Z separate, the frictional forces (to the left) are more than magnetic attraction between Y and Z (1) 		(2)

Question number	Answer	Mark
(ii)	<p>An answer that combines the following points to provide a plan:</p> <ul style="list-style-type: none"> use of a Newton meter used horizontally (1) record largest force observed (1) repeat readings several times under same conditions (1) 	(3)

Question number	Answer	Mark
(iii)	<p>An explanation that combines identification – understanding (1 mark) and reasoning/justification – understanding (1 mark):</p> <ul style="list-style-type: none"> the applied force must be resolved horizontally to determine the force that separates the engine from the trucks and since the (size of) the resolved force is always less than the (size of) the actual force then a larger force (applied at an angle) is needed to separate the trucks from the engine 	(2)

Q2.

	Answer	Acceptable answers	Mark
(i)	B to the left ←		(1)
(ii)	A accelerating		(1)
(iii)	substitution 625×10 (1) Evaluation 6250 (N) (1)	$625 \times 9.8 \text{ } 6125 \text{ (N)}$ give full marks for correct answer, no working	(2)

Q3.

Question number	Answer	Additional guidance	Mark
	<ul style="list-style-type: none"> An arrow showing the 'normal contact force' - from between the two surfaces, acting upwards (1) An arrow showing the 'friction' force – from between the two surfaces (1) Both forces in the correct directions, as shown (1) 	<p>generally upwards / away from the surface</p> <p>can be to the left or to the right</p> <p>they do not need to start from the same point</p>	(3)