Name of the Student:_____
Max. Marks : 18 Marks **Time : 18 Minutes**

Mark Schemes

Q1.

Question Number	Answer	Mark
	B 1.0 m/s **The only correct answer is B** *A 0.1 m/s is incorrect, being 1 metre every 10s, insect crawling pace* *C 10 m/s is incorrect, being an Olympic sprinter's pace, much too fast for 'walking'* *D 100 m/s is incorrect, being a very fast sport's car's pace*	**(1)** AO 1 1

Q2.

	Answer	Acceptable answers	Mark
	substitution F = 1200 × 0.8 (1) evaluation (1) 960 (N)	full marks for correct answer with no working shown.	**(2)**

Q3.

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Question number	Answer	Additional guidance	Mark
(i)	B 1s A is incorrect because this is before the driver reacts. C is incorrect because this is the braking time D is incorrect because 22 is a value of the initial velocity		**1** **AO2.1**

Question number	Answer	Additional guidance	Mark
(ii)	Any **one** from • tiredness • distraction • drugs / alcohol • (old) age	accept similar descriptions any named drug	**1** **AO1.1**

Question number	Answer	Additional guidance	Mark
(iii)	attempt to use the correct part of the graph (1) attempt to find area under graph(1) ½ x b x h evaluation (1) 33 (m)	values of 22(±0.5) and 4 or 22(±0.5) and 3 seen 0.5 x 4 x 22(±0.5) or 0.5 x 3 x 22(±0.5) accept values between 32 and 34 for 3 marks accept values between 43 and 45 for 2 marks accept values between 64.5 and	**3** **AO2.1**

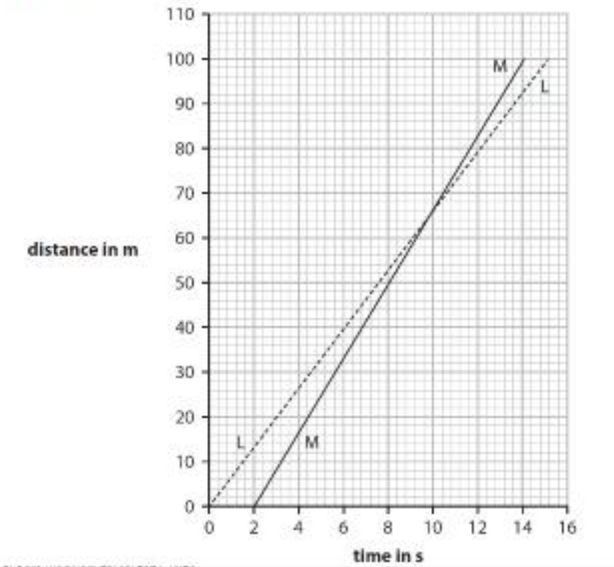
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		67.5 for 1 mark. accept values between 86 and 90 for 1 mark award full marks for the correct answer without working	

Q4.

Question number	Answer	Additional guidance	Mark
(i)	66 (m)	allow values between 64 and 68 inclusive allow values between 32 and 36 as the distance L has to run after M overtakes in this context	**1** **AO3.2**

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Question number	Answer	Additional guidance	Mark
(ii)	select (1) $v = \frac{x}{t}$	allow any identifiable distance from graph divided by any identifiable time from graph e.g. $\frac{100}{15.2}$  	**2** **AO2.1**
	evaluation (1) 6.6 (m/s)	allow values that round to between 6.5 (m/s) and 6.7 (m/s) for example 6.666 (m/s) or 6.579 (m/s) award full marks for correct answer without working	

Q5.

Question number	Answer	Additional guidance	Mark
(i)	speed should be reduced (1)	slower accept specified numerical reduction e.g. from 40 to 20	**1** **AO3.1**

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Question number	Answer	Additional guidance	Mark
(ii)	any **one** from friction (between wheel and road) is reduced (1) braking distance would be longer (on wet road) (1)	allow reverse argument idea that (road) more slippery / car could skid less traction	**1 AO3.1**
	(overall) stopping distance would be longer (on wet road) (1)	longer (time/distance) to stop ignore crash / collision/ accident ignore changes to thinking distance	

Q6.

Question number	Answer	Additional guidance	Mark
(i)	acceleration = $\frac{\text{change in velocity}}{\text{time (taken)}}$	$a = \frac{v-u}{t}$ $a = \frac{\Delta v}{t}$ $\frac{v}{t}$ allow correct rearrangements seen here or in bii	**(1)**

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Question number	Answer	Additional guidance	Mark
(ii)	substitution (1) $\frac{20 - 2}{12}$ evaluation (1) 1.5 (m/s²)	 $\frac{18}{12}$ -1.5 (m/s²) award full marks (1 in bi and 2 in bii) for the correct answer without working, award 1 mark if 20-2 or 18 or 2-20 is seen and no other marks are scored If (incorrectly) $a = \frac{v^2 - u^2}{t}$ given in 3bi $a = \frac{20^2 - 2^2}{12}$ OR = 33 scores 1 mark	(2)

Q7.

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Question number	Answer	Additional guidance	Mark
	any two from: measure {distance / length of pace} (1) use marks on the track (1) use an electronic timer (1) stand midway between the posts/stand closer to a post (1) place posts further apart/increase distance used or measured (1) use 2 people in the timing (1)	Suitable measuring device including trundle wheel / tape/ GPS light gate(s) idea of reducing systematic error such as parallax Do NOT credit repeats	**(2)**

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