

Name of the Student: \_\_\_\_\_

Max. Marks : 16 Marks

Time : 16 Minutes

**Q1.**

- (a) (i) Attempt to determine area under curve  
Number of "large" squares ( $22 \pm 1$ )  
or distance per square = 20 (large) or 0.8 (small)  
 $435 \pm 10$  (m)  
*Zero marks for use of suvat* 3
- (ii) Tangent to curve seen drawn at 10 s  
Gradient of tangent = 4.2 (allow 3.5 – 4.5) ( $\text{m s}^{-2}$ )  
*Zero marks for use of suvat* 2
- (iii)  $640 \times 4$  or 2560 or  $640 \times$  their 7aii  
5800-2560 or 5800-( $640 \times$  their 7aii)  
3200 (3240) (N) 3
- (iv) 89 (read off from graph) cnao  
520 (516) (kW)  
*If answer is in W, then unit must be given* 2
- (b) The marking scheme for this question includes an overall assessment for the quality of written communication (QWC). There are no discrete marks for the assessment of QWC but the candidate's QWC in this answer will be one of the criteria used to assign a level and award the marks for this question.

**Descriptor** – an answer will be expected to meet most of the criteria in the level descriptor.

**Level 3 – good**

- claims supported by an appropriate range of evidence;
- good use of information or ideas about physics, going beyond those given in the question;
- argument is well structured with minimal repetition or irrelevant points;
- accurate and clear expression of ideas with only minor errors of grammar, punctuation and spelling.

**Level 2 – modest**

- claims partly supported by evidence;
- good use of information or ideas about physics given in the question but limited beyond this;
- the argument shows some attempt at structure;
- the ideas are expressed with reasonable clarity but with a few errors of grammar, punctuation and spelling.

**Level 1 – limited**

- valid points but not clearly linked to an argument structure;
- limited use of information about physics;

- unstructured;
- errors in spelling, punctuation and grammar or lack of fluency.

**Level 0**

- incorrect, inappropriate or no response.

*Allow named resistive forces e.g. air resistance, drag, friction.*

*Allow thrust for driving force.*

**Explanation of velocity variation:**

*Car accelerates / Velocity increases because driving force is larger than resistive forces*

*Maximum acceleration at start*

*Resistive forces are zero at start*

*Resistive forces increase with increasing velocity*

*Drag proportional to velocity-squared*

*Resultant force decreases with increasing velocity*

*Acceleration decreases with increasing velocity*

*Terminal velocity reached when resultant force is zero / resistive forces balance the driving force*

**Explanation of change with DRS in use:**

*Resistive forces reduced (because air resistance / drag) is reduced*

*Resultant force is non-zero for longer time*

*Acceleration occurs over longer time*

*Terminal velocity reached in longer time*

*Higher terminal velocity achieved*

*Higher maximum velocity on graph*

*Same initial acceleration / gradient on graph*