Question Number	Scheme	Marks
1.(a)	$\frac{1150}{300} = 3.83...$ so lower bound is 4	M1 A1 **(2)**
(b)	175 135 210 105 100 150 60 20 70 125 175 210 135 105 150 100 60 70 125 **20** 210 175 135 150 105 100 70 125 **60** **20** 210 175 150 135 105 100 125 **70** **60** **20** 210 175 150 135 105 125 **100** **70** **60** **20** 210 175 150 135 125 **105** **100** **70** **60** **20** 210 175 150 135 **125** **105** **100** **70** **60** **20**	M1 A1 A1ft A1cso **(4)**
(c)	Truck 1: **210** 70 20 Truck 2: **175** 125 Truck 3: **150** **135** Truck 4: 105 100 60	**M1** A1 A1 **(3)**
		9 marks

Notes for Question 1

a1M1: Attempt to find the lower bound $(1150 \pm 210)/300$ (a value of 3.83 (or better) seen with no working can imply this mark)
a1A1: Correct calculation seen **or** 3.83 (or better) followed by a lower bound of 4. An answer of 4 with no working scores M0A0. **Only** seeing 3.8 followed by 4 scores M1A0
b1M1: Bubble sort. Consistent direction, end number (20) in place and the list beginning with the correct first five numbers (175 210 135 105 150). Do check these carefully as some candidates show the result of each comparison and swap in their first pass. Consider the placement of the candidate's numbers, rather than what the candidate labels each line of their pass. For example, assume that the first time that the 20 appears at the end of the list is the end of their first pass
b1A1: The first, second **and** third passes correct – so end three numbers in place
b2A1ft: Fourth and fifth passes correct following through from the candidate's third pass – so end five numbers in place
b3A1: cso (correct solution only – so previous three marks must have been awarded in this part). Must show a 6^{th} pass showing no swaps/changes (give bod if the passes are not labelled but do not award this mark if it is clear that after the 5^{th} pass the list is simply being written out again (rather than a genuine 6^{th} pass taking place)). Condone if the sort continues until a 9^{th} pass has been completed (but there should be no changes in the 9^{th} pass)

SC in (b) if list is sorted into ascending order (regardless of reversing at the end of the sort) award
M1 for 135 175 105 100 150 60 20 70 125 210 and then
A1 for 135 105 100 150 60 20 70 125 175 210 **and** 105 100 135 60 20 70 125 135 175 210 so 2 marks max.

c1M1: Their first four items placed correctly and at least eight values placed in trucks (if correct this will be the bold items but must check **their** packing if any of **their** first four values are incorrect – note that the maximum weight is 300). Condone cumulative totals for M1 only. First-fit increasing scores no marks in this part. If no sort seen in (b) then mark (c) assuming the correct ordered list in descending order
c1A1: First eight items placed correctly (the underlined and bold values). No additional or repeated values. No follow through or misreads for the A marks in this part. Must be using the correct ten values (so **any** wrong values regardless of where they appear in the trucks is A0)
c2A1: cso. No additional or repeated values