6.(a)	Bin 3 has the largest sum of the four bins with 72 $\Rightarrow n \geqslant 72$	B1
	After the first three numbers were placed in Bin 1 (with a total of 64) the next smallest value (the 11) could not fit in Bin 1 $\Rightarrow n < 64 + 11$	B1
	$72 \leqslant n \leqslant 74$ oe e.g. $n = 72, 73$ or 74	B1 **(3)**
(b)	middle right 28 31 5 25 16 35 **18** 22 11 27 15 13 Pivots 18 5 16 **11** 15 13 18 28 31 25 **35** 22 27 11, 35 5 11 16 **15** 13 18 28 31 **25** 22 27 35 15, 25 5 11 13 15 16 18 22 25 28 **31** 27 35 31 5 11 13 15 16 18 22 25 28 **27** 31 35 27 5 11 13 15 16 18 22 25 27 28 31 35	M1 A1 A1ft A1 **(4)**
	middle left 28 31 5 25 16 **35** 18 22 11 27 15 13 Pivots 35 28 31 5 25 16 **18** 22 11 27 15 13 35 18 5 16 **11** 15 13 18 28 31 **25** 22 27 35 11, 25 5 11 16 **15** 13 18 22 25 28 **31** 27 35 15, 31 5 11 13 15 16 18 22 25 **28** 27 31 35 28 5 11 13 15 16 18 22 25 27 28 31 35	
(c)	After the 27 has been placed in Bin 2 (giving a total of 55) the 18 was placed in Bin 3 not Bin 2 indicating that $n < 55 + 18$	B1
	$n = 72$	dB1 **(2)**
		9 marks
	Notes for Question 6	
a1B1	Correct reasoning why n is at least 72 States or shows a bin (3) has total 72 and concludes that this is the least value	
a2B1	Correct reasoning regarding the upper bound for n – that is as the second smallest value (the 11) was not put in Bin 1 then $n <$ the sum of Bin 1 + 11	
a3B1	$n = 72, 73$ or 74	
b1M1	Quick sort – pivots, p, selected and first pass gives <p, p, >p. If only choosing 1 pivot per iteration M1 only. If sorting into descending order then mark as a misread	
b1A1	First pass correct and next pivots chosen correctly/consistently for second pass	
b2A1ft	Second and third passes correct (ft from their first pass and choice of pivots)	
b3A1	CSO (including a fifth pass)	
c1B1	Correct reasoning regarding the placement of the 18 in Bin 3 rather than Bin 2 (must explicitly mention 18)	
c2B1	Dependent on previous B mark - CAO ($n = 72$)	

	MISREAD – sorting into descending order	
6.(b)	middle right 28 31 5 25 16 35 **18** 22 11 27 15 13 Pivots: 18 28 31 25 **35** 22 27 18 5 16 **11** 15 13 Pivots: 11, 35 35 28 31 **25** 22 27 18 16 **15** 13 11 5 Pivots: 15, 25 35 28 **31** 27 25 22 18 16 15 13 11 5 Pivots: 31 35 31 28 **27** 25 22 18 16 15 13 11 5 Pivots: 27 35 31 28 27 25 22 18 16 15 13 11 5	M1 A1 A1ft A1 **(4)**
	middle left 28 31 5 25 16 **35** 18 22 11 27 15 13 Pivots: 35 35 28 31 5 25 16 **18** 22 11 27 15 13 Pivots: 18 35 28 31 **25** 22 27 18 5 16 **11** 15 13 Pivots: 11, 25 35 28 **31** 27 25 22 18 16 **15** 13 11 5 Pivots: 15, 31 35 31 **28** 27 25 22 18 16 15 13 11 5 Pivots: 28 35 31 28 27 25 22 18 16 15 13 11 5	
	Notes for Question 6	
b1M1	Quick sort – pivots, p, selected and first pass gives <p, p, >p. If only choosing 1 pivot per iteration M1 only. If sorting into descending order then mark as a misread	
b1A1	First pass correct and next pivots chosen correctly/consistently for second pass	
b2A1ft	Second and third passes correct (ft from their first pass and choice of pivots)	
b3A1	CSO (including a fifth pass)	
	REMOVE final two A marks earned in this section so max 2/4	