Question Number	Scheme	Marks
5(a)	(4, 4, 4) (4, 4, 6) (4, 4 8)	B1
	(4, 4, 4) (4, 4, 6) (4, 6, 4) (6, 4, 4) (4, 4, 8) (4, 8, 4) (8, 4, 4)	B1
		(2)
(b)	(4, 4, 4) $\left(\frac{1}{2}\right)^3\left[=\frac{1}{8}\right]$	M1M1
	(4, 4, 6) $3\times\left(\frac{1}{2}\right)^2\times\left(\frac{3}{10}\right)\left[=\frac{9}{40}\right]$ (4, 4, 8) $3\times\left(\frac{1}{2}\right)^2\times\left(\frac{2}{10}\right)\left[=\frac{3}{20}\right]$	
	$\mathrm{P}(M=4)=\frac{1}{8}+\frac{9}{40}+\frac{3}{20}=\frac{1}{2}$	M1A1
		(4)
(c)	$\mathrm{P}(M=8)=\left(\frac{2}{10}\right)^3+3\times\left(\frac{2}{10}\right)^2\times\frac{1}{2}+3\times\left(\frac{2}{10}\right)^2\times\frac{3}{10}\left[=\frac{13}{125}\right]$	M1 M1
	$\mathrm{P}(M=6)=\left(\frac{3}{10}\right)^3+3\times\left(\frac{3}{10}\right)^2\times\frac{1}{2}+3\times\left(\frac{3}{10}\right)^2\times\frac{2}{10}+6\times\frac{1}{2}\times\frac{3}{10}\times\frac{2}{10}\left[=\frac{99}{250}\right]$	A1
	m | 4 | 6 | 8 $\mathrm{P}(M=m)$ | $\frac{1}{2}$ [= 0.5] | $\frac{99}{250}$ [= 0.396] | $\frac{13}{125}$ [= 0.104]	A1
		(4)
(d)	$1-"\frac{99}{250}"="\frac{151}{250}"\Rightarrow \quad \left("\frac{151}{250}"\right)^n<0.05$	M1
	$n>5.94$ or $n>\frac{\log(0.05)}{\log\left("\frac{151}{250}"\right)}$ or $n>\log_{\left("\frac{151}{250}"\right)}(0.05)$ or $\left("\frac{151}{250}"\right)^5$ **and** $\left("\frac{151}{250}"\right)^6$	dM1
	$n=6$	A1
		(3)

	Notes		Total 13
(a)	**B1**	For the 3 distinct possibilities	
	B1	For all 7 possibilities with no errors or additions. Allow (4, 4, 4) (4, 4, 6)×3 (4, 4, 8)×3	
(b)	**M1**	For a correct calculation for $\mathrm{P}(M=4)$ (may be embedded in an overall calculation)	
	M1	For 2 correct calculations for $\mathrm{P}(M=4)$ (may be embedded in an overall calculation)	
	M1	For adding all 3 correct calculations together	
	A1	oe Must come from correct working. Answer only is 0 out of 4.	
(c)	**M1**	For a correct calculation for either $\mathrm{P}(M=8)$ **or** $\mathrm{P}(M=6)$ (implied by 1st A1)	
	M1	For a correct calculation for both $\mathrm{P}(M=8)$ **and** $\mathrm{P}(M=6)$ allow $1-"\frac{1}{2}"-\frac{99}{250}$ or $1-"\frac{1}{2}"-\frac{13}{125}$	
	A1	For either $\frac{13}{125}$ or $\frac{99}{250}$	
	A1	Fully correct sampling distribution. Need not be in a table.	
	SC:	If M0M0 scored but $\mathrm{P}(M=4)+\mathrm{P}(M=6)+\mathrm{P}(M=8)=1$, score M0M1A0A0 Except in the case where $\mathrm{P}(M=4)=0.5$, $\mathrm{P}(M=6)=0.3$, $\mathrm{P}(M=8)=0.2$ which scores 0.	
(d)	**M1**	For 1 – 'P(M = 6)' < 0.05 (allow = or any inequality sign)	
	dM1	(dep on previous M1) For n > 5.9(4) (allow = or any inequality sign) **or** a correct method using logs to find the value of n **or** correct trial and improv. method	