Question Number	Scheme	Marks
3 (a)	If all possible samples are chosen from a population, then **all** the **values** of a **statistic** and their associated **probabilities** is a sampling distribution **or** a **probability distribution** of a **statistic**	B1
		(1)
(b)	111 112 (×3) 122 (×3) 222	B1 B1
		(2)
(c)	$\frac{5}{3}$	B1
		(1)
(d)	$p^3 = \frac{27}{125}$	M1
	$p = 0.6$ and $q = 0.4$	A1
	$\left[b = \mathrm{P}\left(\frac{4}{3}\right)\right] = 3 \times p^2 \times q$	M1
	$\left[c = \mathrm{P}\left(\frac{5}{3}\right)\right] = 3 \times p \times q^2$	M1
	$\left[d = \mathrm{P}(2)\right] = q^3$	M1
	$b = \frac{54}{125} = 0.432$ $c = \frac{36}{125} = 0.288$ $d = \frac{8}{125} = 0.064$	A1
		(6)
(e)	m | 1 | 2 P($M = m$) | $\frac{81}{125} = 0.648$ | $\frac{44}{125} = 0.352$	B1 M1 A1
		(3)
		Total 13

		Notes
(a)	**B1**	A correct explanation including underlined words o.e.
(b)	**B1**	For three correct combinations
	B1	All four combinations (condone permutations) with no additional incorrect ones
(c)	**B1**	Allow awrt 1.67
(d)	**M1**	For a correct method to find p
	A1	For $p = 0.6$ and $q = 0.4$ may be implied by a correct calculation
	M1	A correct method to find $\mathrm{P}\left(\frac{4}{3}\right)$ ft their p and q
	M1	A correct method to find $\mathrm{P}\left("\frac{5}{3}"\right)$ ft their p and q
	M1	A correct method to find $\mathrm{P}(2)$ ft their p and q
	A1	cao
(e)	**B1**	For $m = 1$ and $m = 2$ only

	M1	For either $\frac{27}{125}+'\frac{54}{125}'$ ft their b or $'\frac{36}{125}'+'\frac{8}{125}'$, ft their c and d
	A1	cao