Question Number	Scheme	Marks
2 (a)	20, 20, 20 20, 20, 50 (×3) 20, 50, 50 (×3) 50, 50, 50	B2
		(2)
(b)	$a = 30$ and $b = 40$	B1
		(1)
(c)	$p^3 = \frac{4913}{8000}$ or $q^3 = \frac{27}{8000}$	M1
	$p = \frac{17}{20}$ (0.85) and $q = \frac{3}{20}$ (0.15)	A1
		(2)
(d)	$[\text{P}(30)] = 3\times"p^2"\times"q"$ $[\text{P}(40)] = 3\times"p"\times"q^2"$	M1 M1
	$c = \frac{2601}{8000}$ $d = \frac{459}{8000}$	A1
		(3)
(e)	M: 20, 50 P($M = m$): $\frac{3757}{4000}$, $\frac{243}{4000}$	B1 M1 A1ft
		(3)
	Notes	**Total 11**

(a)	**B2**	For all 4 correct combinations (B1 for 3 correct combinations) Ignore extraneous repetitions of any of the given combinations
(b)	**B1**	For $a = 30$ and $b = 40$
(c)	**M1**	Either $p^3 = \frac{4913}{8000}$ or $q^3 = \frac{27}{8000}$
	A1	$p = 0.85$oe and $q = 0.15$oe
(d)	**M1**	$[\text{P}(30)] = 3\times(\text{their } p)^2\times(\text{their } q)$ or $[\text{P}(40)] = 3\times(\text{their } p)\times(\text{their } q)^2$ must see values substituted and must be using their values from part (c)
	M1	$[\text{P}(30)] = 3\times(\text{their } p)^2\times(\text{their } q)$ and $[\text{P}(40)] = 3\times(\text{their } p)\times(\text{their } q)^2$ or use of sum of probabilities = 1 i.e. $c + d = \frac{153}{400}$
	A1	For $c = \frac{2601}{8000} (= 0.325125)$ and $d = \frac{459}{8000} (= 0.057375)$
(e)	**B1**	For 20 and 50 only (ignore notation used for M)
	M1	Either $\frac{4913}{8000} + \text{their } c$ or $\frac{27}{8000} + \text{their } d$ for ft answers only values will need to be checked
	A1ft	For $\frac{3757}{4000}$ oe and $\frac{243}{4000}$ oe Follow through their values for c and d but P($M = 20$) + P($M = 50$) must sum to 1 (A table is not required).
	NB	If a and b are reversed then allow $a = 40$ and $b = 30$ – this will mean $p = 0.15$ and $q = 0.85$, $c = \frac{459}{8000}$ $d = \frac{2601}{8000}$