Question Number	Scheme	Marks
4(a)	[Let J = the length of a jump] P(J < 2.5) = $\mathrm{P}\left(Z < \frac{2.5-3.3}{0.6}\right)$	M1
	[= P(Z < −1.333…) = 1 − 0.9082] = 0.0912 to 0.0918	A1
		(2)
(b)	$\left[\mathrm{P}(J > d) = 0.4 \Rightarrow\right]$ $\frac{d-3.3}{0.6} = 0.2533$ or $\frac{3.3-d}{0.6} = -0.2533$	M1A1
	d = 3.45198 awrt 3.452	A1
		(3)
(c)	$\left[\mathrm{P}(J > m \mid J > d) \Rightarrow\right]$ $\frac{\mathrm{P}(J > m)}{0.4} = 0.5$ or P(J > m) = 0.2	M1
	$\frac{m-3.3}{0.6} = 0.8416$ or $\frac{3.3-m}{0.6} = -0.8416$	M1
	m = 3.80496 (calc 3.80497…) awrt 3.8[0]	A1
		(3)
(d)	P(J > 4.1) = 0.0918 (same as (a))	B1ft
	So P(certificate) = $0.4\times$"(a)"	M1
	= 0.036 to 0.037	A1
		(3)

	Notes		Total 11
(a)	**M1**	For standardising with 2.5, 3.3 and 0.6 Allow ± and ignore inequality Must show the standardisation	
	A1	For an answer in the range 0.0912 to 0.0918 **NB** calc gives 0.09121128…	
(b)	**M1**	For standardising with d (allow any letter for d), 3.3 and 0.6 and setting equal to z where 0.2 < |z| < 0.3 Must show the standardisation	
	A1	For a correct equation with z = ± 0.25 or better (allow any letter for d) z value must be compatible with their standardisation	
	A1	For awrt 3.452 (calc gives 3.45200… use of 0.2533 gives 3.4519…)	
(c)	**M1**	For a correct probability statement involving J and m (median) only Allow any letter for J and m May be implied by awrt 3.8[0]/3.81 or 2nd M mark	
	M1	For $\frac{m-3.3}{0.6} = z$ where 0.84 ≤ z < 0.85 or $\frac{3.3-m}{0.6} = z$ where −0.85 < z ≤ −0.84 May be implied by awrt 3.8[0]/3.81 Allow any letter for m	
	A1	Awrt 3.8[0] (accept 3.805)	
(d)	**B1ft**	For an answer in the range 0.0912 to 0.0918 or same as part (a) for P(J > 4.1) Allow any letter for J	
	M1	For 0.4 × their P(J > 4.1)	
	A1	For answer in the range 0.036 to 0.037 **NB** 0.4 × 0.0918 = 0.036712 and 0.4 × 0.0912 = 0.03648	