Question Number	Scheme	Marks
7. (a)	$\left[\frac{0.1}{0.8}\right] = \underline{\mathbf{\frac{1}{8}}}$	B1 (1)
(b)	$[0^2 \times 0.1+] 5^2 \times 0.2 + 10^2 \times 0.7 = 75$*	B1*cso (1)
(c)	$\mathrm{E}(X) = [0 \times 0.1+] 5 \times 0.2 + 10 \times 0.7 [= 8]$ $\mathrm{Var}(X) = 75 - (\text{'8'})^2$ $\mathrm{Var}(X) = \underline{\mathbf{11}}$	M1 M1 A1 (3)
(d)	$\mathrm{Var}(4-3X) = 3^2 \times \mathrm{Var}(X) [= 3^2 \times \text{"11"}]$ $= \underline{\mathbf{99}}$	M1 A1ft (2)
(e)	P((0, 5), (0, 10), (5, 10)) $= 0.1\times0.2 + 0.1\times0.7 + 0.2\times0.7$ $[= 0.02 + 0.07 + 0.14]$ $= \underline{\mathbf{0.23}}$ P((0, 0), (5, 5), (10, 10) $= 1 - (0.1^2 + 0.2^2 + 0.7^2)$ $[= 0.5(1 - (0.01 + 0.04 + 0.49))]$ $= \underline{\mathbf{0.23}}$	M1M1 A1 (3)
(f)	Products: 0, 25, 50, 100 $\mathrm{P}(D=0) = 0.1 + 0.1 - 0.1\times0.1 [= 0.19]$ $\mathrm{P}(D=25) = 0.2^2$ $\mathrm{P}(D=50) = 2\times0.2\times0.7$ $\mathrm{P}(D=100) = 0.7^2$ D: **0**, **25**, **50**, **100** P($D = d$): **0.19**, **0.04**, **0.28**, **0.49**	B1 M1 M1 A1 (4)
	Notes	**Total 14**
(a)	B1 $\frac{1}{8}$ oe Allow 0.125 Do not ISW	
(b)	B1*cso correct expression and 75 with no errors seen. Allow $5^2 \times 0.2 + 10^2 \times 0.7 = 75$	
(c)	M1 correct method to find mean. If no method seen award if 8 is seen M1 attempt at expression for variance ie 75 –(their E(X))^2 A1 11 cao	
(d)	M1 Use of $(-3)^2 \times \mathrm{Var}(X)$ (condone 3 rather than –3 and missing bracket if final answer is correct) or $4^2 \times 0.1 + (-11)^2 \times 0.2 + (-26)^2 \times 0.7 - (-20)^2$ condone 11, 26 and 20 A1ft 99 or ft 9 × 'their (c)'	
(e)	1st M1 for at least one correct product. **NB** may be combined eg 0.3×0.7 but not in the numerator or denominator of a fraction 2nd M1 a fully correct expression oe e.g. $0.1\times0.2 + 0.3\times0.7$ A1 0.23 oe	
(f)	B1 all 4 correct products with no incorrect extras unless they have a probability of 0 associated with them 1st M1 A correct method to find 1 of the 4 probabilities. Does not need to be associated with the correct product **ALT** $\mathrm{P}(D=0) = 0.1\times0.1 + 2\times0.1\times0.2 + 2\times0.1\times0.7 [= 0.19]$ 2nd M1 A correct method to find 3 of the 4 probabilities or 2 of the 4 probabilities if the total of the 4 probabilities is 1 Must be associated with the correct product A1 all four correct probabilities (oe) associated with the correct products	

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