Question Number	Scheme	Marks
6(a)	Any two from: • **Probability** that a **pot** will **crack** is constant (0.3) • **Pots crack** independently/randomly • **Batch size** / number of **pots fired** (n) is constant	B1B1 (2)
(b)	$[8 \times 0.3 =]$ 2.4	B1 (1)
(c)	Let X = number of pots which crack $X \sim B(8, 0.3)$ $P(X = 2) = {}^8C_2 \times 0.3^2 \times 0.7^6$ $= 0.29647\ldots$ awrt 0.296/0.297	 M1 A1 (2)
(d)	$P(X \leqslant 5) = 0.9887$ $[k =]$ 6	M1 A1 (2)
(e)	H_0: $p = 0.3$ H_1: $p < 0.3$ Under H_0, $Y \sim B(20, 0.3)$ $P(Y \leqslant 2) = 0.0355$ $P(Y \leqslant 3) = 0.1071$ C.R. is $Y \leqslant 2$	B1 M1 A1cao (3)
(f)	3.55% or 0.0355	B1 (1)
		Total 11

		Notes
(a)	B1	for an assumption in a correct context. Must have words in bold
	B1	for a second assumption need not be in context. Also ignore incorrect context **NB** 2 correct assumptions not in context gets **B0B1**
(c)	M1	for a correct expression ${}^8C_2 \times p^2 \times (1-p)^6$ oe where $0 < p < 1$or $P(X \leqslant 2) - P(X \leqslant 1)$ oe
	A1	for awrt 0.296/0.297
(d)	M1	For $P(X \leqslant 5) = 0.9887$ or $P(X \geqslant 6) = 0.0113$ or $P(X \leqslant k-1) = 0.9887$ (Implied by $[k =]$ 6). Do not allow $P(X \geq k) = 0.0113$
	A1	Need to state 6 and not have it as part of a probability statement.
(e)	B1	for both hypotheses correct (must be in terms of p or π) and attached to H_0 and H_1 correctly
	M1	for writing the correct binomial or evidence of correct use of binomial e.g. 0.0355 or 0.1071 seen. Implied by a correct lower CR
	A1	Allow any letter, condone missing letter. Allow $Y < 3$ (A probability statement ie $P(X \leqslant 2)$ for final answer scores A0). Do not allow if there is an upper critical region given as well.