Question Number	Scheme	Marks
4. (a)	Randomly select a student from 1 to 7 oe	B1
	Take every 7th student	B1
		(2)
(b)	$\nu = 10-1=9$ $\quad \chi^2_9(10\%) = 14.684$	B1 B1ft
	No evidence (at 10% level of significance) that the **digits** generated do not follow a **uniform distribution**.	dB1
		(3)
(c)	H_0 : Uniform distribution is a good fit (for the two-digit numbers generated) H_1 : Uniform distribution is not a good fit (for the two-digit numbers generated)	B1
	O | E | $\frac{(O-E)^2}{E}$ | $\frac{O^2}{E}$ 31 | 40 | 2.025 | 24.025 49 | 40 | 2.025 | 60.025 30 | 40 | 2.5 | 22.5 42 | 40 | 0.1 | 44.1 48 | 40 | 1.6 | 57.6 200 | 200 | 8.25 | 208.25	B1 M1 A1
	$\sum \frac{(O-E)^2}{E} = 8.25$ or $\sum \frac{O^2}{E} - 200 = 8.25$	A1
	$\chi^2_4(10\%) = 7.779$	B1
	[8.25 > 7.779] Reject H_0 / Significant	M1
	There is evidence to suggest the two-digit **numbers** generated may not follow a **uniform distribution**.	A1
		(8)
(d)	To generate a simple random sample, Luka would need to generate **two-digit** numbers (from 00 to 69)	B1
	But Luka's table would not be suitable for generating **random** two-digit numbers	B1ft
		(2)
		Total 15
	Notes	
(a)	B1 for the idea of generating a random number to determine first student selected B1 for every 7th student (not just select 40 students)	
(b)	B1 for correct degrees of freedom (may be implied by 2nd B1) B1ft for correct critical value 14.684 or better ft their d.f. so may see $\chi^2_{10}(10\%) = 15.987$ B1 (dependent upon 2nd B1) for correct conclusion in context with digits (oe) and uniform distr.	
(c)	B1 Both hypotheses correct B1 All expected values = 40 M1 Attempting $\frac{(O-E)^2}{E}$ or $\frac{O^2}{E}$ with at least 3 correct (1 dp truncated or rounded) or f.t. their E A1 all $\frac{(O-E)^2}{E}$ or $\frac{O^2}{E}$ correct (1 dp truncated or rounded). May be implied by 8.25 or 208.25 A1 8.25 oe B1 correct critical value 7.779 or better M1 for a correct non-contextual conclusion (ignore any contradictory contextual comments for this mark) based on their cv and their test statistic A1 correct conclusion in context **with all previous marks scored**	
(d)	B1 for the idea of generating **two-digit** numbers (for a simple random sample) B1ft Luka's table not suitable for generating two-digit random numbers for a simple random sample, ft parts (b) and (c)	
SC:	If B0B0 scored, 'table only suitable for generating one-digit **random** numbers' scores B0B1	