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CAMBRIDGE
International Education

Cambridge International AS & A Level

MATHEMATICS **9709/53**

Paper 5 Probability & Statistics 1 **May/June 2026**

MARK SCHEME

Maximum Mark: 50

Published

This mark scheme contains the instructions and marking guidance that our examiners used to mark candidate responses for this component.

Before they start marking, examiners complete a standardisation process. They review a range of candidate responses and discuss the mark scheme in detail to agree which answers can and cannot be accepted. Examiners award marks where it is clear that candidate responses have met the requirements of the mark scheme. These requirements may vary between different components or different versions of the same component, depending on the exact requirements of the question and the candidate responses seen during the standardisation process.

Sometimes, our mark schemes may allow marks to be awarded to responses which contain elements that are factually incorrect or for content not covered by the syllabus. We do this in response to the demands of a specific question to support candidates and make sure that our assessments are fair. However, these allowances should not be used as a guide for teaching and learning.

We cannot discuss the mark scheme with schools, and we recommend that schools read the mark scheme together with the assessment material and the Principal Examiner Report for Teachers.

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General marking principles

All examiners must apply these marking principles when marking candidate responses.

1	Examiners must award marks for each response in line with: • the specific **content** defined in the mark scheme • the specific **skills** defined in the mark scheme or in the level descriptions • the **standard of response** required as exemplified by the standardisation scripts.
2	Examiners must award **whole marks** (not half marks, or other fractions).
3	Examiners must award marks **positively**. This means that: • marks are not deducted for errors or omissions • marks are awarded for correct/valid answers as defined in the mark scheme and also for **other valid answers** which go beyond the scope of the syllabus and mark scheme referring to your team leader as appropriate • the quality of spelling, punctuation and grammar are judged **only** when the mark scheme indicates that these features are **specifically assessed** in the question. However, the meaning of all responses must be unambiguous.
4	Examiners must **consistently** apply the requirements of the mark scheme and any rules for what to do when candidates have not followed instructions correctly.
5	Examiners must use the **full range of marks** defined in the mark scheme, unless limited by the quality of the candidate responses seen.
6	Examiners must award marks according to the mark scheme and **must not** award marks with grade thresholds or grade descriptions in mind.

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Mathematics-Specific Marking Principles

1 Unless a particular method has been specified in the question, full marks may be awarded for any correct method. However, if a calculation is required then no marks will be awarded for a scale drawing.

2 Unless specified in the question, non-integer answers may be given as fractions, decimals or in standard form. Ignore superfluous zeros, provided that the degree of accuracy is not affected.

3 Allow alternative conventions for notation if used consistently throughout the paper, e.g. commas being used as decimal points.

4 Unless otherwise indicated, marks once gained cannot subsequently be lost, e.g. wrong working following a correct form of answer is ignored (isw).

5 Where a candidate has misread a number or sign in the question and used that value consistently throughout, provided that number does not alter the difficulty or the method required, award all marks earned and deduct just 1 A or B mark for the misread.

6 Recovery within working is allowed, e.g. a notation error in the working where the following line of working makes the candidate's intent clear.

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Annotations guidance for centres

Examiners use a system of annotations as a shorthand for communicating their marking decisions to one another. Examiners are trained during the standardisation process on how and when to use annotations. The purpose of annotations is to inform the standardisation and monitoring processes and guide the supervising examiners when they are checking the work of examiners within their team. The meaning of annotations and how they are used is specific to each component and is understood by all examiners who mark the component.

We publish annotations in our mark schemes to help centres understand the annotations they may see on copies of scripts. Note that there may not be a direct correlation between the number of annotations on a script and the mark awarded. Similarly, the use of an annotation may not be an indication of the quality of the response.

The annotations listed below were available to examiners marking this component in this series.

Annotations

Annotation	Meaning
	More information required
	Accuracy mark awarded zero
	Accuracy mark awarded one
	Independent accuracy mark awarded zero
	Independent accuracy mark awarded one
	Independent accuracy mark awarded two
	Benefit of the doubt
	Blank Page
	Incorrect
Dep	Used to indicate DM0 or DM1

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Annotation	Meaning
DM1	Dependent on the previous M1 mark(s)
FT	Follow through
	Indicate working that is right or wrong
Highlighter	Highlight a key point in the working
ISW	Ignore subsequent work
J	Judgement
JU	Judgement
M0	Method mark awarded zero
M1	Method mark awarded one
M2	Method mark awarded two
MR	Misread
O	Omission or Other solution
Off-page comment	Allows comments to be entered at the bottom of the RM marking window and then displayed when the associated question item is navigated to.
On-page comment	Allows comments to be entered in speech bubbles on the candidate response.
PE	Judgment made by the PE
Pre	Premature approximation
SC	Special case
SEEN	Indicates that work/page has been seen

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Annotation	Meaning
SF	Error in number of significant figures
✓	Correct
TE	Transcription error
XP	Correct answer from incorrect working

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Question	Answer	Marks	Guidance
1(a)	$\left[\left(\frac{7}{8}\right)^6 \times \frac{1}{8}\right] = 0.0561,\ \frac{117649}{2097152}$	**B1**	Accept 0.0560994… to at least 3SF.
		1	
1(b)	**EITHER:** **Method 1**		
	$1-\left(\frac{7}{8}\right)^9$	**(M1**	$1-\left(\frac{7}{8}\right)^r$, $r = 9,10$.
	= 0.699	**A1)**	AWRT, $\frac{93864121}{134217728}$.
	OR: **Method 2**		
	$\frac{1}{8}+\left(\frac{1}{8}\right)\left(\frac{7}{8}\right)+\left(\frac{1}{8}\right)\left(\frac{7}{8}\right)^2+\left(\frac{1}{8}\right)\left(\frac{7}{8}\right)^3+\left(\frac{1}{8}\right)\left(\frac{7}{8}\right)^4+\left(\frac{1}{8}\right)\left(\frac{7}{8}\right)^5$ $+\left(\frac{1}{8}\right)\left(\frac{7}{8}\right)^6+\left(\frac{1}{8}\right)\left(\frac{7}{8}\right)^7+\left(\frac{1}{8}\right)\left(\frac{7}{8}\right)^8$	**(M1**	$\frac{1}{8}+\left(\frac{1}{8}\right)\left(\frac{7}{8}\right)+\left(\frac{1}{8}\right)\left(\frac{7}{8}\right)^2+\left(\frac{1}{8}\right)\left(\frac{7}{8}\right)^3+\left(\frac{1}{8}\right)\left(\frac{7}{8}\right)^4+$ $\left(\frac{1}{8}\right)\left(\frac{7}{8}\right)^5+\left(\frac{1}{8}\right)\left(\frac{7}{8}\right)^6+\left(\frac{1}{8}\right)\left(\frac{7}{8}\right)^7+\left(\frac{1}{8}\right)\left(\frac{7}{8}\right)^8+\left[+\left(\frac{1}{8}\right)\left(\frac{7}{8}\right)^9\right]$
	= 0.699	**A1)**	AWRT, $\frac{93864121}{134217728}$. **SCB1** if **M1** not scored and at least first 3 terms and last term present.
	Available marks	**2**	

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Question	Answer	Marks	Guidance
1(c)	**EITHER:** **Method 1**		
	[P(1, 2, 3) =] ${}^{12}C_1\left(\frac{1}{8}\right)^1\left(\frac{7}{8}\right)^{11} + {}^{12}C_2\left(\frac{1}{8}\right)^2\left(\frac{7}{8}\right)^{10} + {}^{12}C_3\left(\frac{1}{8}\right)^3\left(\frac{7}{8}\right)^9$ (= 0.345287 + 0.271297 + 0.129189)	**(M1**	One term of the form ${}^{12}C_x\ (p)^x\ (1-p)^{12-x}$, $0 < p < 1,\ x \neq 0$ or 12.
		A1	Correct un-simplified expression.
	= 0.746	**B1)**	$0.7455 \leqslant p \leqslant 0.746$.
	OR: **Method 2**		
	[1 – P(0) – P(4,5,6,7,8,9,10,11,12) =] $1-\{\left(\frac{7}{8}\right)^{12} + {}^{12}C_4\left(\frac{1}{8}\right)^4\left(\frac{7}{8}\right)^8 + {}^{12}C_5\left(\frac{1}{8}\right)^5\left(\frac{7}{8}\right)^7 + {}^{12}C_6\left(\frac{1}{8}\right)^6\left(\frac{7}{8}\right)^6 + {}^{12}C_7\left(\frac{1}{8}\right)^7\left(\frac{7}{8}\right)^5 + {}^{12}C_8\left(\frac{1}{8}\right)^8\left(\frac{7}{8}\right)^4 + {}^{12}C_9\left(\frac{1}{8}\right)^9\left(\frac{7}{8}\right)^3 + {}^{12}C_{10}\left(\frac{1}{8}\right)^{10}\left(\frac{7}{8}\right)^2 + {}^{12}C_{11}\left(\frac{1}{8}\right)^{11}\left(\frac{7}{8}\right) + \left(\frac{1}{8}\right)^{12}\}$	**(M1**	One term of the form ${}^{12}C_x\ (p)^x\ (1-p)^{12-x}$, $0 < p < 1,\ x \neq 0$ or 12.
		A1	Correct un-simplified expression. Condone missing final bracket } but first bracket must be present {.
	= 0.746	**B1)**	$0.7455 \leqslant p \leqslant 0.746$.
	Available marks	**3**	

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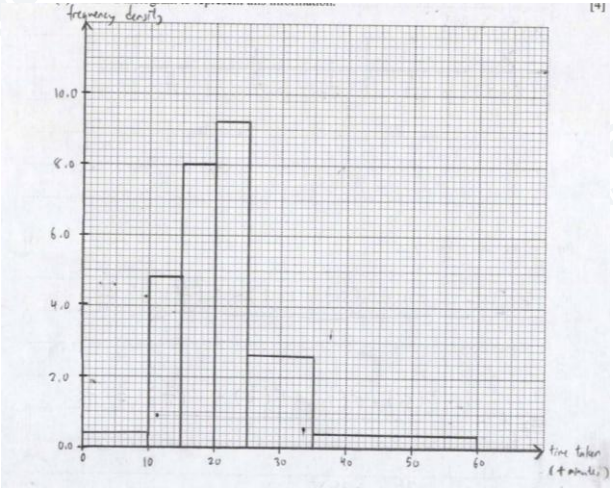
<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th><th>Guidance</th></tr>
<tr><td rowspan="4">2(a)</td><td>$[22k = 1]$ $k = \frac{1}{22}$</td><td>B1</td><td>May be implied by use in the table.</td></tr>
<tr><td rowspan="2"><table>
<tr><td>x</td><td>–2</td><td>0</td><td>1</td><td>3</td></tr>
<tr><td>[P(X=x)]</td><td>[k]</td><td>[k]</td><td>[4k]</td><td>[16k]</td></tr>
<tr><td>[P(X=x)]</td><td>$\frac{1}{22}$,
0.04545</td><td>$\frac{1}{22}$,
0.04545</td><td>$\frac{4}{22}$,
0.1818</td><td>$\frac{16}{22}$,
0.72727</td></tr>
</table></td><td>B1</td><td>Table with correct values of x and at least one non-zero probability correct or FT their k, $0 < k < 1$.</td></tr>
<tr><td>B1</td><td>4 correct probabilities linked with the correct outcomes. Accept probabilities not in table if clearly identified.
Non-exact probabilities to at least 3SF.</td></tr>
<tr><td></td><td>3</td><td></td></tr>
</table>

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Question	Answer	Marks	Guidance
2(b)	[E(X) =] $-2\times k$ + [0 +] $1\times 4k + 3\times 16k$ [=$50k$] Or $[\mathrm{E}(X) =]\left[-2\times\frac{1}{22}+\left[0\times\frac{1}{22}+\right]1\times\frac{4}{22}+3\times\frac{16}{22}\right]$ or $\quad =-\frac{2}{22}+\left[0+\right]\frac{4}{22}+\frac{48}{22}\left[=\frac{50}{22}\right]$	**M1**	**FT** numerical with their k. $0 < k < 1$. May be implied by use in variance, accept un-simplified expression.
	$\mathrm{Var}(X) = \frac{1\times(-2)^2+\left[1\times 0^2+\right]4\times 1^2+16\times 3^2}{22}$ Or $\frac{1\times 4+0+4\times 1+16\times 9}{22}-\left(\frac{50}{22}\right)^2$	**M1**	$\left(k\times(-2)^2+\left[k\times 0^2+\right]4k\times 1^2+16k\times 3^2\right)-$ $\left(-2\times k+\left[0+\right]1\times 4k+3\times 16k\right)^2$ is acceptable, with or without their numerical k value substituted. $0 < k < 1$. Note: if table is correct $\frac{152}{22}-\left(\text{their } \mathrm{E}(X)\right)^2$ is **M1.**
	= 1.74	**A1**	Accept $\frac{211}{121}$, $1\frac{90}{121}$, 1.7438…to at least 3SF . **SCB1** for 1.74 if **M0 M1** scored.
		3	

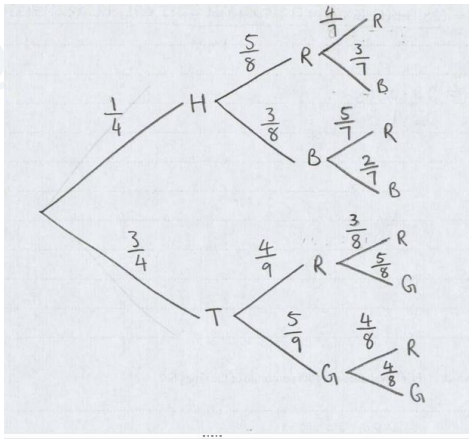
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Question	Answer	Marks	Guidance
3(a)	<table><tr><td>Cw</td><td>10</td><td>5</td><td>5</td><td>5</td><td>10</td><td>25</td></tr><tr><td>fd</td><td>0.4</td><td>4.8</td><td>8</td><td>9.2</td><td>2.6</td><td>0.4</td></tr></table>	**M1**	At least 4 frequency densities calculated. $\left(\frac{f}{cw}\text{ e.g.}\frac{4}{10},\text{ condone }\frac{f}{cw\pm 0.5}\text{ if unsimplified}\right)$. Accept un-simplified, may be read from graph using *their* scale no lower than 1 cm = fd 1.
		A1	All bar heights correct on graph, **NOT FT**, daylight rule, using their suitable linear scale with at least 3 values indicated. At least 50% of the grid must be used for each axis.
		B1	Bar ends at 10, 15, 20, 25, 35, 60. All 6 bars drawn, with at least 3 values indicated, $0 \leqslant$ horizontal scale $\leqslant 60$. At least 50% of the grid must be used for each axis.
		B1	Axes labelled frequency density (fd) time (t) and minutes, OE, or an appropriate title. (Axes may be reversed).
		4	

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Question	Answer	Marks	Guidance
3(b)	Midpoints: 5 12.5 17.5 22.5 30 47.5	**B1**	At least 5 correct midpoints seen, may be un-simplified, may be in calculation, may be by data table.
	Mean = $\dfrac{4\times5+24\times12.5+40\times17.5+46\times22.5+26\times30+10\times47.5}{150}$ $\left[=\dfrac{3310}{150}\right]$ The 'table' approach may be used with multiplications and additions implied by appropriate values.	**M1**	Correct un-simplified mean formula with *their* 6 midpoints (**not** upper bound, lower bound, upper limit, lower limit, class width, frequency density, frequency **and** must be within class), accept un-simplified. Condone **1 value error** on numerator. Accept $\dfrac{20+300+700+1035+780+475}{150}$.
	$= 22.1,\ 22\dfrac{1}{15},\ 22\dfrac{10}{150}$	**A1**	Accept 22.066… to at least 3 SF. Condone 22.066. Improper fractions are not acceptable.
		3	
3(c)	$15 \leqslant t < 20$	**B1**	Condone 15 – 20, $15 < t < 20$, $15 \leqslant t \leqslant 20$ Third class.
		1	

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Question	Answer	Marks	Guidance
4(a)		**B1**	Fully correct structure labelled tree diagram. Probabilities for coin correct. $\frac{1}{4}, \frac{3}{4}$.
		B1	**Probabilities** for Bag A and Bag B correct (irrespective of correct coin toss being present). First draw $\frac{5}{8}, \frac{3}{8}, \frac{4}{9}, \frac{5}{9}$. Second draw $\frac{4}{7}, \frac{3}{7}, \frac{5}{7}, \frac{2}{7}$ $\frac{3}{8}, \frac{5}{8}, \frac{4}{8}, \frac{4}{8}$.
		2	

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Question	Answer	Marks	Guidance
4(b)	[P(RR) =] $\frac{1}{4}\times\frac{5}{8}\times\frac{4}{7}+\frac{3}{4}\times\frac{4}{9}\times\frac{3}{8}$ ***or*** $\frac{1}{4}\times\frac{20}{56}+\frac{3}{4}\times\frac{12}{72}$ [P(BB) =] $\frac{1}{4}\times\frac{3}{8}\times\frac{2}{7}$ ***or*** $\frac{1}{4}\times\frac{6}{56}$ [P(GG) =] $\frac{3}{4}\times\frac{5}{9}\times\frac{4}{8}$ ***or*** $\frac{3}{4}\times\frac{20}{72}$	**M1**	$\frac{a}{4}\times\frac{b}{8}\times\frac{c}{7 or 8}$ *or* $\frac{d}{4}\times\frac{e}{9}\times\frac{f}{8 or 9}$ seen or $\frac{a}{4}\times\frac{b}{56 or 64}$ *or* $\frac{c}{4}\times\frac{d}{72 or 81}$ seen. The answers to the calculations may be seen on the tree diagram.
	[P(RR) + P(BB) + P(GG) =] $\left(\frac{5}{56}+\frac{1}{8}\right)+\frac{3}{112}+\frac{5}{24}$	**M1**	3 correct **scenarios** added – maybe identified on tree diagram or by seeing P(RR) + P(BB) + P(GG). Condone either $\frac{5}{56}$ *or* $\frac{1}{8}$ OE missing. Implied by un-simplified terms.
	$\frac{151}{336}$, 0.449	**A1**	AWRT.
		3	

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Question	Answer	Marks	Guidance
4(c)	P(H ∩ 1R or 2R) = $\frac{1}{4}\times\frac{5}{8}\times\frac{4}{7}+\frac{1}{4}\times\frac{5}{8}\times\frac{3}{7}+\frac{1}{4}\times\frac{3}{8}\times\frac{5}{7}\left[=\frac{25}{112}\right]$ Or $\frac{1}{4}\times\frac{20}{56}+\frac{1}{4}\times\frac{15}{56}+\frac{1}{4}\times\frac{15}{56}\left[=\frac{25}{112}\right]$	**M1**	Or $\frac{1}{4}\times\frac{5}{8}+\frac{1}{4}\times\frac{3}{8}\times\frac{5}{7}$ or $\frac{1}{4}\left(1-\left(\frac{3}{8}\times\frac{2}{7}\right)\right.$ or $\frac{1}{4}\times\frac{5}{8}+\frac{1}{4}\times\frac{15}{56}$ Or $\frac{1}{4}\left(1-\frac{3}{28}\right)$. **FT** from their correct structure tree diagram.
	P(1R or 2R) = [1 – P(BB) – P(GG)]= $1-\frac{3}{112}-\frac{5}{24}$ Or $\frac{1}{4}\times\frac{5}{8}\times\frac{4}{7}+\frac{1}{4}\times\frac{5}{8}\times\frac{3}{7}+\frac{1}{4}\times\frac{3}{8}\times\frac{5}{7}+\frac{3}{4}\times\frac{4}{9}\times\frac{3}{8}+\frac{3}{4}\times\frac{4}{9}\times\frac{5}{8}+\frac{3}{4}\times\frac{5}{9}\times\frac{4}{8}$ Or $\frac{1}{4}\times\frac{20}{56}+\frac{1}{4}\times\frac{15}{56}+\frac{1}{4}\times\frac{15}{56}+\frac{3}{4}\times\frac{12}{72}+\frac{3}{4}\times\frac{20}{72}+\frac{3}{4}\times\frac{20}{72}$	**M1**	**FT** from their correct structure tree diagram. Or *their* value for P(H ∩ 1R or 2R) + $(\frac{3}{4}\times\frac{4}{9}\times\frac{3}{8}+\frac{3}{4}\times\frac{4}{9}\times\frac{5}{8}+\frac{3}{4}\times\frac{5}{9}\times\frac{4}{8})$, or 1 – $(\frac{1}{4}\times\frac{3}{8}\times\frac{2}{7}+\frac{3}{4}\times\frac{5}{9}\times\frac{4}{8})$, or t*heir* value for P(H ∩ 1R or 2R) + $(\frac{3}{4}\times\frac{12}{72}+\frac{3}{4}\times\frac{20}{72}+\frac{3}{4}\times\frac{20}{72})$, or 1 – $(\frac{1}{4}\times\frac{6}{56}+\frac{3}{4}\times\frac{20}{72})$
	[P(H|1R or 2R) = $\frac{\textit{their}\,\mathrm{P}(\mathrm{H}\cap 1\mathrm{R}\text{ or }2\mathrm{R})}{\textit{their}\,\mathrm{P}(1\mathrm{R}\text{ or }2\mathrm{R})}$] = $\frac{\textit{their}\,\frac{25}{112}}{\textit{their}\,\frac{257}{336}}$	**M1**	Correct fraction calculation seen – accept un-simplified, or **FT** their **clearly identified** P(H ∩ 1R or 2R) and P(1R or 2R) used to form conditional probability.

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Question	Answer	Marks	Guidance
4(c)	$\frac{75}{257}$, 0.292	**A1**	Accept 0.2918…. to at least 3SF. If 1 or more **M** mark not scored, **SCB1** for $\frac{75}{257}$, 0.292 WWW.
		4	

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Question	Answer	Marks	Guidance
5(a)	[P(105 < X < 135) =] P($\frac{105-125}{8} < Z < \frac{135-125}{8}$)	**M1**	Use of ±standardisation formula once with 125, 8 and either 105 or 135. No continuity correction. No $\sigma^2, \sqrt{\sigma}$.
	[$\Phi(2.5)+\Phi(1.25)-1$] = 0.9938 + 0.8944 – 1 Or (0.9938 – 0.5) + (0.8944 – 0.5) Or 0.9938 – 0.1056 Or 0.8944 – 0.0062 Or 0.4938 + 0.3944	**M1**	Calculating the appropriate probability area, must be a probability. Values given here come from tables and may be slightly different if using values from a calculator. Leading to their final answer, expect > 0.5.
	= 0.888	**A1**	AWRT If 1 or more **M** mark not awarded, **SCB1** for final answer 0.888 WWW.
		3	
5(b)	[P(X < 2.7) = P$\left(Z < \frac{2.7-2.5}{\sigma}\right)$ = 0.81]	**B1**	0.8775 ⩽ z < 0.8785, −0.8785 < z ⩽ −0.8775 seen.
	$\frac{2.7-2.5}{\sigma} = 0.878$	**M1**	2.7 and 2.5 substituted in ± standardisation formula equated to a z-value, $\pm\left(\frac{0.2}{\sigma}\right)$ equated to a z-value scores **M1** BOD. No continuity correction, not $\sigma^2, \sqrt{\sigma}$. **NB** 0.81, 0.19, 0.7910, 0.5753, 0.2090, 0.4247 are NOT z-values. (1 – z-value) is not a z-value.
	[σ=] $\frac{100}{439}$, 0.228	**A1**	AWRT 0.228.
		3	

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Question	Answer	Marks	Guidance
5(c)	[Mean =] $0.81\times80=64.8$ $[\text{Variance}]\ 64.8\times0.19=12.312\ ,\frac{1539}{125}$	**B1**	64.8 and 12.312 or 12.31 seen, allow un-simplified. May be in standardisation formula. ($\sigma=\sqrt{12.312}$, 3.5088, $\frac{9\sqrt{95}}{25}\ldots$ to at least 4SF implies correct variance). **Withhold mark if variance clearly identified as standard deviation.** Condone $\text{N}\left(64.8,\sqrt{12.312}\right)$ if <u>standardisation formula correct</u> *or* variance/standard deviation stated correctly as well.
	[P($X<60$) =] $\text{P}\left(Z<\frac{59.5-64.8}{\sqrt{12.312}}\right)$	**M1**	Substituting *their* 64.8 and *their* 12.312 into ±standardisation formula, any number for 59.5, allow σ^2, $\sqrt{\sigma}$.
		M1	Use continuity correct 59.5 or 60.5 in *their* standardisation formula. Note: if no standardisation formula seen $\pm\left(\frac{-5.3}{\sqrt{12.312}}\right)$ *or* $\pm\left(\frac{-5.3}{3.509}\right)$ scores **M2** BOD.
	[P($Z<$ -1,5105) = $\Phi(-1.5105)=1-\Phi(1.5105)$] = 1 – 0.9345	**M1**	Appropriate area Φ, from final process, must be a probability. May be implied by a sketch of the required probability areas. Note: **correct** final answer implies this **M1**. Expect final answer < 0.5.
	= 0.0655	**A1**	**Final answer.** Accept $0.0654\leqslant p\leqslant0.06555$.
		5	

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Question	Answer	Marks	Guidance
6(a)	**EITHER:** **Method 1** Number of arrangements with 4 Ss together – number of arrangements with 4 Ss together and the 2 Os together		
	$\frac{7!}{2!}-6!$	**(M1**	$a-6!$, $a>720$. Or $a-4!\times5\times6$, $a>720$, a must be an integer.
		M1	$\frac{7!}{c!}-(k!\times n,\ n=1 or 2)$. k = 5 or 6 and c = 1 or 2.
	[= 2520 – 720] = 1800	**A1)**	
	OR: **Method 2** ^ SSSS ^ ^ ^ 4 Ss treated as a single item and inserting the Os		
	5! × $^6C_2$	**(M1**	5! × m, $m>1$.
		M1	n × $^6C_2$ or n × $^6C_4$ or $n\times\frac{6\times5}{2}$ or $n\times\frac{^6P_2}{2!}$. Condone n × $^6P_2$ or n × $^6P_4$ or n × 6× 5, n must be an integer.
	[= 120 × 15] = 1800	**A1)**	
	Available marks	**3**	

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Question	Answer	Marks	Guidance
6(b)	**EITHER:** **Method 1** P O ^ ^ ^ ^ O ^ ^ N		
	$\frac{6!}{4!}\times 3$	**(B1**	$\frac{6!}{4!}\times b,\ b\geqslant 1,\ b$ an integer.
		M1	$c\times 3,\ c\geq 6$, c an integer.
	90	**A1)**	
	OR: **Method 2** P O ^ ^ ^ ^ O * * N letters between Os arranged and treated as a single item		
	$\frac{^6\mathrm{P}_4}{4!}\times 3!$ or $^6\mathrm{C}_4\times 3!$	**(B1**	$\left(\frac{^6\mathrm{P}_4}{4!}or\ \ ^6\mathrm{C}_4\right)\times d,\ d\geqslant 1.,\ d$ an integer.
		M1	$e\times 3!,\ e\geqslant 6$, e an integer.
	90	**A1)**	
	Available marks	**3**	

Question	Answer	Marks	Guidance
6(c)	S S O – – $^4C_2$ 6 S S O O – $^4C_1$ 4 S S S O – $^4C_1$ 4 S S S O O [$^4C_0$] 1 S S S S O [$^4C_0$] 1	**M1**	One identified outcome $^4C_k \times n$, $k = 1,2, 3$ and $n \geqslant 1$.
		M1	3 outcomes of the form $^4C_k \times n$, $k = 1, 2$ and $n \geqslant 1$ un-simplified.
	6 + 4 + 4 +1 + 1	**M1**	5 correct scenarios added (values do not need to be correct) may be identified by un-simplified expressions.
	[Number of selections =] 16	**A1**	If one or more **M** marks are not scored **SCB1** for 16 WWW.
		4	

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