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CAMBRIDGE
International Education

# Cambridge International AS & A Level

**MATHEMATICS** **9709/55**

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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**[Turn over**

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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:<br><br>• the specific **content** defined in the mark scheme<br>• the specific **skills** defined in the mark scheme or in the level descriptions<br>• 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:<br><br>• marks are not deducted for errors or omissions<br>• 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<br>• 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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## Mark Scheme Notes

The following notes are intended to aid interpretation of mark schemes in general, but individual mark schemes may include marks awarded for specific reasons outside the scope of these notes.

### Types of mark

**M** Method mark, awarded for a valid method applied to the problem. Method marks are not lost for numerical errors, algebraic slips or errors in units. However, it is not usually sufficient for a candidate just to indicate an intention of using some method or just to quote a formula; the formula or idea must be applied to the specific problem in hand, e.g. by substituting the relevant quantities into the formula. Correct application of a formula without the formula being quoted obviously earns the M mark and in some cases an M mark can be implied from a correct answer.

**A** Accuracy mark, awarded for a correct answer or intermediate step correctly obtained. Accuracy marks cannot be given unless the associated method mark is earned (or implied).

**B** Mark for a correct result or statement independent of method marks.

**DM** or **DB** When a part of a question has two or more 'method' steps, the M marks are generally independent unless the scheme specifically says otherwise; and similarly, when there are several B marks allocated. The notation DM or DB is used to indicate that a particular M or B mark is dependent on an earlier M or B (asterisked) mark in the scheme. When two or more steps are run together by the candidate, the earlier marks are implied and full credit is given.

**FT** Implies that the A or B mark indicated is allowed for work correctly following on from previously incorrect results. Otherwise, A or B marks are given for correct work only.

- A or B marks are given for correct work only (not for results obtained from incorrect working) unless follow through is allowed (see abbreviation FT above).
- For a numerical answer, allow the A or B mark if the answer is correct to 3 significant figures or would be correct to 3 significant figures if rounded (1 decimal place for angles in degrees).
- The total number of marks available for each question is shown at the bottom of the Marks column.
- Wrong or missing units in an answer should not result in loss of marks unless the guidance indicates otherwise.
- Square brackets [ ] around text or numbers show extra information not needed for the mark to be awarded.

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**Abbreviations**

| | |
|---|---|
| AEF/OE | Any Equivalent Form (of answer is equally acceptable) / Or Equivalent |
| AG | Answer Given on the question paper (so extra checking is needed to ensure that the detailed working leading to the result is valid) |
| CAO | Correct Answer Only (emphasising that no 'follow through' from a previous error is allowed) |
| CWO | Correct Working Only |
| ISW | Ignore Subsequent Working |
| SOI | Seen Or Implied |
| SC | Special Case (detailing the mark to be given for a specific wrong solution, or a case where some standard marking practice is to be varied in the light of a particular circumstance) |
| WWW | Without Wrong Working |
| AWRT | Answer Which Rounds To |

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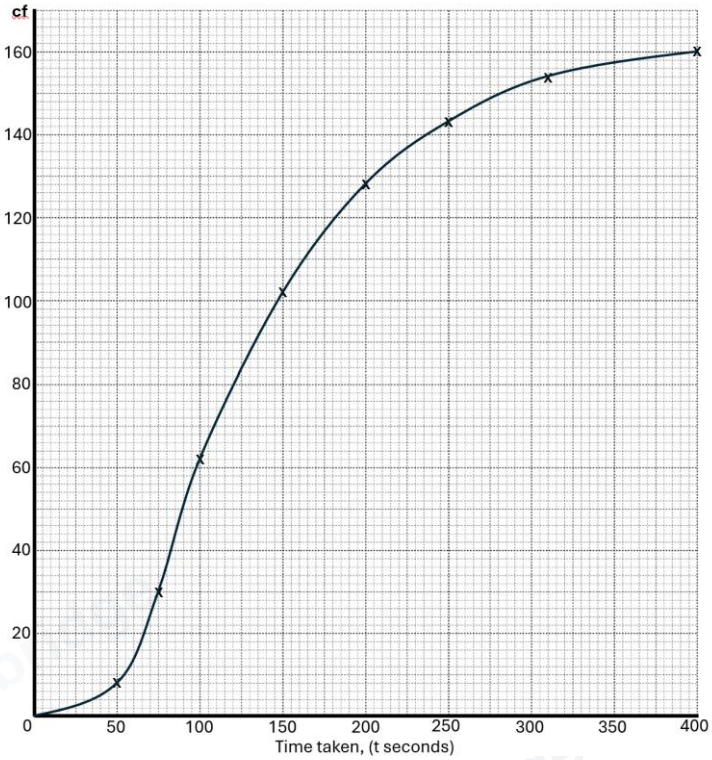


| Question | Answer | Marks | Guidance |
|---|---|---|---|
| 1(a) | [$Sd^2$ =] $\frac{32460}{60} - \left(\frac{642}{60}\right)^2$ | **M1** | |
| | [Sd = $\sqrt{541 - 114.49} = \sqrt{426.51}$ ] = 20.7 | **A1** | 20.652…rounded to at least 3SF.<br>**SCB1** if **M** mark withheld WWW. |
| | | **2** | |
| 1(b) | $\sum x - 60c = 642$<br>Or<br>$95.7 \times 60 = 642 + 60c$ oe<br>Or $95.7 - c = \frac{642}{60}$ or 10.7 | **M1** | |
| | $c = 85$ | **A1** | |
| | | **2** | |

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| Question | Answer | Marks | Guidance |
|---|---|---|---|
| 2(a) |  | **B1** | • At least **5** points plotted accurately at class upper endpoints (50,8), (75,30), (100,62), (150,102), (200,128), (250,143), (310,154), (400,160).<br>• Linear cf scale 0 ⩽ cf ⩽ 160 and linear time scale 50 ⩽ time ⩽ 400 with at least 3 values identified on each.<br>• Bar charts/histograms score **B0.**<br>• Axes can be the other way round. |
| | | **B1** | • All points plotted correctly, curve drawn (no line segments) and joined to (0,0) and curve passing within ½ square of plotted points.<br>• Axes labelled cumulative frequency (cf), time (t) and seconds (s, sec).<br>• Axes must be over 50% of grid size.<br>• Curve must not rise above 160 before the final point.<br><br>If 0/2 scored, **SCB1** for plotting 8 points **at correct height** (not (0,0)), curve drawn, no line segment and joined to (0,0) passing within ½ square of plotted points to create an increasing curve. Axes correctly labelled. |
| | | **2** | |
| 2(b) | 180 ⩽ UQ ⩽ 190 – 80 ⩽ LQ ⩽ 85 | **M1** | Use of graph must be seen for either the UQ **or** LQ. Must be an increasing graph – indicate on 2a grid where seen.<br>**FT** incorrect increasing graph. |
| | [IQR = ] 105 | **A1** | 95 ⩽ IQR ⩽ 110. |
| | | **2** | |

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| Question | Answer | Marks | Guidance |
|---|---|---|---|
| 3(a) | $0.2\times0.25+0.35\times0.4+0.45\times x=0.505$<br>$[0.45x = 0.315]$ | **M1** | Three 2-factor probability terms (p(drink)×p(cake)) added to form an equation in $x$ equated to 0.505. |
| | $[x =]$ 0.7 | **A1** | If **M1** not scored, **SCB1** for $[x =]$ 0.7 WWW. |
| | | **2** | |
| 3(b) | $\left[P(\text{juice}\mid\text{not cake})=\dfrac{\text{P}(\text{juice}\cap\text{not cake})}{\text{P}(\text{not cake})}\right]$<br>$=\dfrac{0.35\times0.6}{1-0.505}=\dfrac{0.21}{0.495}$ | **B1** | $1 - 0.505$ or 0.495 or $\dfrac{99}{200}$.<br>(or $0.2\times0.75+0.35\times0.6+0.45\times0.3$ ) seen on its own as a numerator or denominator in a fraction. |
| | | **M1** | $\left[\text{P}(\text{juice}\cap\text{not cake})=\right]$.<br>$0.35\times0.6$ *or* $0.35\times(1-0.4)$ seen as the numerator of a fraction. |
| | $= 0.424,\ \dfrac{14}{33}$ | **A1** | **SCB1** if **M0**. |
| | | **3** | |

| Question | Answer | Marks | Guidance |
|---|---|---|---|
| 4(a) | **EITHER:**<br>**Method 1** | | |
| | [P($X < 7$) = 1 – (P(7, 8, 9)) =]<br><br>$1 - ({}^9C_7 (0.8)^7 (0.2)^2 + {}^9C_8 (0.8)^8 (0.2)^1 + (0.8)^9 (0.2)^0)$<br><br>[= 1 – (0.3019899 + 0.3019899 + 0.1342177)] | **(M1** | ${}^9C_x (p)^x (1-p)^{9-x}$ With $0 < p < 1$, $x \neq 0$ or 9<br><br>Note: $\sum_a^b {}^9C_x (p)^x (1-p)^{9-x}$ implies **M1** With $0 < p < 1$, $x \neq 0$ or 9, $b \leqslant 8$, $a < b$. |
| | | **A1** | Correct un-simplified expression.<br>Allow 9 for ${}^9C_8$.<br>Condone omission of final bracket.<br><br>Note: $1 - \sum_{x=7}^{9} {}^9C_x (0.8)^x (0.2)^{9-x}$ implies **M1A1**, condone $p$ not substituted if clearly stated, e.g. $p = 0.8$. |
| | = 0.262 | **B1)** | $0.2615 < p \leqslant 0.262$. |
| | **OR:**<br>**Method 2** | | |
| | [P($X < 7$) = P(0, 1, 2, 3, 4, 5, 6) =]<br>$(0.8)^0 (0.2)^9 + {}^9C_1 (0.8)^1 (0.2)^8 + {}^9C_2 (0.8)^2 (0.2)^7 + {}^9C_3 (0.8)^3 (0.2)^6 + {}^9C_4 (0.8)^4 (0.2)^5 + {}^9C_5 (0.8)^5 (0.2)^4 + {}^9C_6 (0.8)^6 (0.2)^3$ | **(M1** | ${}^9C_x (p)^x (1-p)^{9-x}$ with $0 < p < 1, x \neq 0$ or 9.<br><br>Note: $\sum_a^b {}^9C_x (p)^x (1-p)^{9-x}$ implies **M1** With $0 < p < 1$, $x \neq 0$ or 9, $b \leqslant 8$, $a < b$. |

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| Question | Answer | Marks | Guidance |
|---|---|---|---|
| 4(a) | | **A1** | Correct un-simplified expression. Allow 9 for ${}^9C_8$<br>Condone omission of up to 4 of the 5 middle terms.<br><br>Note: $\sum_{x=0}^{6} {}^9C_x (0.8)^x (0.2)^{9-x}$ implies **M1A1**, condone $p$ not substituted if clearly stated, e.g. $p = 0.8$. |
| | = 0.262 | **B1)** | $0.2615 < p \leqslant 0.262$. |
| | Available marks | **3** | |

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| Question | Answer | Marks | Guidance |
|---|---|---|---|
| 4(b) | [Mean = $0.8\times120=$] 96,<br>[variance $=0.2\times96=$]19.2 | **B1** | 96 and 19.2 seen, allow un-simplified, may be seen in the standardisation formula-<br>$\sigma=\sqrt{19.2}$ *or* $\frac{4\sqrt{30}}{5}$, $4.3817\leqslant\sigma\leqslant4.382$ implies correct variance.<br><br>**Withhold mark if variance is clearly identified as standard deviation.**<br>Condone $\mathrm{N}\left(96,\sqrt{19.2}\right)$ if value substituted appropriately into standardisation formula *or* the variance/standard deviation correctly identified as well. |
| | $\mathrm{P}(X>90)=\mathrm{P}\left(Z>\frac{90.5-96}{\sqrt{19.2}}\right)$ | **M1** | Substituting *their* $\mu$ and positive $\sigma$ into the ±standardisation formula (any number for 90.5), allow $\sigma^2$ *or* $\sqrt{\sigma}$. |
| | | **M1** | Use continuity correction 89.5 or 90.5 in *their* ±standardisation formula.<br><br>Note: If no standardisation formula seen $\pm\left(\frac{5.5}{\sqrt{19.2}}\right)$ *or* $\pm\left(\frac{5.5}{4.382}\right)$ scores **M2** BOD. |
| | [= P($Z>-1.255$) = P($Z<1.255$) = Φ(1.255)] 0.8953 | **M1** | Appropriate area Φ, from final process, must be a probability.<br><br>Note: correct **final** answer implies this **M1**.<br>Expect final answer > 0.5. |
| | = 0.895(3) | **A1** | **Final answer**<br>Accept $0.895\leqslant p<0.8955$.<br>If they multiply this correct probability by 120, they get **M1A0**. |
| | | **5** | |

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| Question | Answer | Marks | Guidance |
|---|---|---|---|
| 5(a) | $x$ \| 0 \| 1 \| 2 \| 3<br>P(X=$x$) \| $\frac{4}{16}$ \| $\frac{6}{16}$ \| $\frac{4}{16}$ \| $\frac{2}{16}$<br>\| $\frac{2}{8}$ \| $\frac{3}{8}$ \| $\frac{2}{8}$ \| $\frac{1}{8}$<br>\| $\frac{1}{4}$ \| $\frac{3}{8}$ \| $\frac{1}{4}$ \| $\frac{1}{8}$<br>\| 0.25 \| 0.375 \| 0.25 \| 0.125 | **B1**<br><br>**B1** | Table with correct $x$ values and at least 1 correct probability associated with correct x-value.<br>Values need not be in order, lines may not be drawn, may be vertical.<br>$x$ and P($x$) may be omitted.<br>Condone any additional $x$ values if probability stated as 0.<br><br>Two **more** correct probabilities correctly linked to the correct $x$ values, need not be in table, accept un-simplified.<br>(3 correct probabilities now present). |
| | | **B1** | 4 correct probabilities linked with correct $x$ values,<br>**SCB1** 4 non-zero probabilities (not all 1/4) summing to 1 placed in a probability distribution table with correct $x$ values if they have only scored 0 or 1 mark(s). |
| | | **3** | |

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| Question | Answer | Marks | Guidance |
|---|---|---|---|
| 5(b) | $[\mathrm{E}(X) =] \left[0\times\frac{4}{16}+\right] 1\times\frac{6}{16}+2\times\frac{4}{16}+3\times\frac{2}{16}$<br>$\left[\frac{6+8+6}{16}=\frac{5}{4}\right]$ | **M1** | Accept un-simplified expression. May be calculated in variance.<br>Accept $\frac{3}{8}+\frac{1}{2}+\frac{3}{8}$ oe for the **M** mark.<br>**FT** *their* table with 4 non - zero probabilities summing to 1 ($0 < p < 1$) as long as working is clear. |
| | $\mathrm{Var}(X) = \frac{6\times1^2+4\times2^2+2\times3^2}{16} - \mathit{their}\left(\frac{5}{4}\right)^2$<br>$\left[\frac{[0+][1\times]6+4\times4+9\times2}{16}-\frac{25}{16}\right]$ | **M1** | Appropriate variance formula using *their* $(\mathrm{E}(X))^2$ value<br>**FT** *their* table with 3 or more non-zero probabilities ($0 < p < 1$) which need not sum to 1 correct. |
| | $= \frac{15}{16}$, 0.9375 | **A1** | CAO.<br>**SCB1** if first **M** mark is withheld. |
| | | **3** | |
| 5(c) | $\left(\frac{14}{16}\right)^6\times\frac{2}{16}$ or $\left(\frac{14}{16}\right)^6-\left(\frac{14}{16}\right)^7$ | **B1FT** | $(1-p)^6\,p$ with $p$ = *their* $\frac{2}{16}$<br>or $(1-p)^6-(1-p)^7$. |
| | | **1** | |

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| Question | Answer | Marks | Guidance |
|---|---|---|---|
| 5(d) | ${}^6\mathrm{C}_2\left(\frac{2}{16}\right)^3\left(\frac{14}{16}\right)^4$ | **M1** | $k\times(q)^3(1-q)^4$ ,<br>$k$ integer $\geqslant 1$ in a single term. |
| | | **M1** | ${}^6\mathrm{C}_2(q)^a(1-q)^b$,<br>$a + b = 6,7,8$ in a single term.<br>Accept ${}^6\mathrm{C}_2$, $\frac{{}^6\mathrm{P}_2}{2!}$, 15. |
| | = 0.0172 | **A1** | AWRT,<br>$\frac{288120}{2097152}$ OE. |
| | | **3** | |

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| Question | Answer | Marks | Guidance |
|---|---|---|---|
| 6(a) | $P(412 < X < 424) = P\left(\frac{412-420}{6.4} < Z < \frac{424-420}{6.4}\right)$ | **M1** | Substituting 420 and 6.4 and **either** 412 **or** 424 appropriately into one ±standardising formula, allow $\sigma^2$ or $\sqrt{\sigma}$ **no** continuity correction.<br>Note: $-\frac{8}{6.4} or \frac{4}{6.4}$ scores **M1** BOD. |
| | $[= \Phi(1.25) + \Phi(0.625) - 1]$<br>$= 0.8944 + 0.7340 - 1$<br>$= (0.8944 - 0.5) + (0.7340 - 0.5)$<br>$= 0.8944 - (1 - 0.7340)$<br>$= 0.7340 - (1 - 0.8944)$ | **M1** | Appropriate area Φ, from final process. Must be a probability.<br>Expect final answer > 0.5.<br>Condone omission of brackets if recovered for *their* values. |
| | $= 0.628, \frac{1571}{2500}$ | **A1** | $0.628 \leqslant p \leqslant 0.6285$. |
| | | **3** | |
| 6(b) | $P(X > 245) = \frac{42}{500} = 0.0840$<br>$P\left(Z < \frac{245-240}{\sigma}\right) = 1 - 0.0840 = 0.916$ | **B1** | 0.084[0] or 0.916 seen. |
| | $\frac{245-240}{\sigma} = 1.378$ | **M1** | Equating ± standardisation formula with 245, 240 and $\sigma$, condone continuity correction, to a z-value.<br>Note: these are NOT z-values: 0.8201; 0.1799; 0.5335; 0.4665; 0.7995; 0.6628; 0.084; 0.916. |
| | $\left[\sigma = \frac{5}{1.378} =\right] 3.63$ | **A1** | AWRT. |
| | | **3** | |

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| Question | Answer | Marks | Guidance |
|---|---|---|---|
| 6(c) | $\left[P\left(X>1.2\mu\right)=\right]P\left(Z>\dfrac{1.2\mu-\mu}{0.25\mu}\right)$ | **B1** | Substituting $\mu$, $1.2\mu$ and $0.25\mu$ appropriately into ±standardising formula, no continuity correction, $\sigma^2$ or $\sqrt{\sigma}$. |
| | [= P $(Z>0.8)$ =]1 – 0.7881 , | **M1** | Appropriate area Φ, from final process. Must be a probability. Expect final answer < 0.5. |
| | 0.212 | **A1** | AWRT. |
| | | **3** | |

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| Question | Answer | Marks | Guidance |
|---|---|---|---|
| 7(a) | **EITHER:**<br>**Method 1** total arrangements with 3 As together – total arrangements with 3 As together and 2 Ns together | | |
| | $\frac{7!}{2!} - 6!$ | **(B1** | $\frac{7!}{2!} - m$, where $m \geq 0$. |
| | | **M1** | $b - k!$, $k = 5$ or 6, $b > 720$.<br>You may see this as $b - 30 \times 4!$. |
| | [= 2520 – 720 =] 1800 | **A1)** | CAO. |
| | **OR:**<br>**Method 2** ^ ^ AAA ^ ^ , arrangements with AAAs together and no Ns, Ns inserted separately | | |
| | $5! \times \frac{6 \times 5}{2}$ | **(B1** | $5! \times d$, $d$ integer $\geqslant 1$. |
| | | **M1** | $f \times \frac{6 \times 5}{2}, f > 1$ accept ${}^6C_2$ or $\frac{{}^6P_2}{2}$. |
| | 1800 | **A1)** | CAO. |
| | Available marks | **3** | |

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| Question | Answer | Marks | Guidance |
|---|---|---|---|
| 7(b) | **EITHER:**<br>**Method 1** | | |
| | [Numerator = ] $\frac{7!}{3!}\times 4$ | **(B1** | $\frac{7!}{3!}\times d,\ d\geqslant 1$ in a single term. |
| | | **M1** | $\frac{7!}{e}\times 4,\ e\geqslant 1$ in a single term. |
| | [Total number of ways =] $\frac{9!}{2!3!}\ \left(=30240\right)$ | **B1** | Seen as denominator of a fraction. |
| | $\frac{3360}{30240}=\frac{1}{9}$ | **A1)** | |
| | **OR:**<br>**Method 2** | | |
| | ${}^{7}\mathrm{P}_{4}\times\frac{4!}{3!}$ | **(B1** | ${}^{7}\mathrm{P}_{4}\times k,\ k\geqslant 1$ in a single term. |
| | | **M1** | ${}^{7}\mathrm{P}_{m}\times\frac{4!}{3!}$ or ${}^{7}\mathrm{P}_{m}\times 4,\ m=3,4,5.$<br>in a single term. |
| | [Total number of ways =] $\frac{9!}{2!3!}\ \left(=30240\right)$ | **B1** | Seen as denominator of a fraction. |
| | $\frac{3360}{30240}=\frac{1}{9}$ | **A1)** | |

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<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th><th>Guidance</th></tr>
<tr><td rowspan="6">7(b)</td><td>OR:<br>Method 3</td><td></td><td></td></tr>
<tr><td rowspan="3">$\frac{4\times7!\times2!}{9!}$</td><td>(B1</td><td>$\frac{4\times7!\times g}{f!}$, (g, f) $\geqslant 1$ in a single term.</td></tr>
<tr><td>M1</td><td>$\frac{h\times7!\times2!}{f!}$ , (h, f) $\geqslant 1$ in a single term.</td></tr>
<tr><td>B1</td><td>$\frac{h\times7!\times g}{9!}$, (h, g) $\geqslant 1$ in a single term.</td></tr>
<tr><td>$=\frac{1}{9}$</td><td>A1)</td><td></td></tr>
<tr><td>Available marks</td><td>4</td><td></td></tr>
<tr><td rowspan="4">7(c)</td><td>Method 1</td><td></td><td></td></tr>
<tr><td><table>
<tr><td>4 letters</td><td>3 letters</td><td>2 letters</td><td></td><td></td></tr>
<tr><td>A A A ^</td><td>N N ^</td><td>^ ^</td><td>$^4C_1 \times {}^3C_1$ [$\times {}^2C_2$]</td><td>12</td></tr>
<tr><td>A A A ^</td><td>^ ^ ^</td><td>N N</td><td>$^4C_1$ [$\times {}^3C_3$]</td><td>4</td></tr>
<tr><td>N N ^ ^</td><td>A A A</td><td>^ ^</td><td>$^4C_2$ [$\times {}^2C_2$]</td><td>6</td></tr>
<tr><td>^ ^ ^ ^</td><td>A A A</td><td>N N</td><td>$^4C_4$</td><td>1</td></tr>
</table></td><td>B1<br>M1</td><td>Correct no of ways for 2 identified scenarios, accept un-simplified.<br>No of ways for 4 correct scenarios added, may be identified by correct un-simplified expressions.<br>Accept 12 + 4 + 6 + 1 OE.</td></tr>
<tr><td>[Total number of ways =] 23</td><td>A1</td><td></td></tr>
<tr><td></td><td>3</td><td></td></tr>
</table>

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