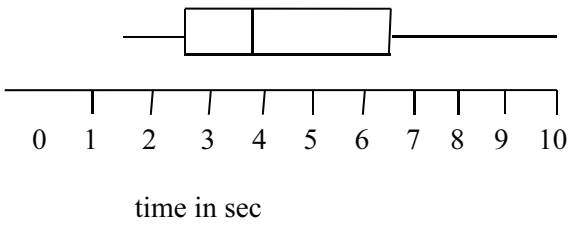


Page 4	Mark Scheme	Syllabus	Paper
	Cambridge International AS/A Level – May/June 2015	9709	62

1	$P(3, 4, 5) =$ ${}^{10}C_3 \left(\frac{1}{6}\right)^3 \left(\frac{5}{6}\right)^7 + {}^{10}C_4 \left(\frac{1}{6}\right)^4 \left(\frac{5}{6}\right)^6 + {}^{10}C_5 \left(\frac{1}{6}\right)^5 \left(\frac{5}{6}\right)^5$ $= 0.222$	M1 A1 A1	Bin expression of form ${}^{10}C_x (p)^x (1-p)^{10-x}$ any x any p Correct unsimplified answer accept (0.17, 0.83), (0.16, 0.84), (0.16, 0.83), (0.17, 0.84) or more accurate Correct answer
2	mid points 13, 30.5, 40.5, 50.5, 73 Mean = $\frac{4 \times 13 + 24 \times 30.5 + 38 \times 40.5 + 34 \times 50.5 + 20 \times 73}{120}$ $= \frac{5500}{120} = 45.8$ var = $\frac{4 \times 13^2 + 24 \times 30.5^2 + 38 \times 40.5^2 + 34 \times 50.5^2 + 20 \times 73^2}{120} - (45.8\dots)^2$ $= \frac{278620}{120} - 45.8\dots^2$ $= 2321.8333 - 45.8\dots^2$ sd = 14.9	M1 M1 A1 M1 A1	Attempt at midpoints at least 3 correct Using their midpoints i.e. cw, ucb, 1/2 cw and freqs into correct formula must be divided by 120 Correct answer from correct working Evaluating $\frac{\sum fx^2}{120} - \text{their } \bar{x}^2$ must see their 45.8^2 subtracted allow cw etc Correct answer
3 (i)		B1 B1 B1 B1	LQ = 2.6 med = 3.8– 3.85, UQ = 6.4– 6.6 Correct quartiles and median on graph fit linear from 2–10 End whiskers correct not through box Label need seconds and linear 2–10 axis or can have 5 values on boxplot no line provided correct
(ii)	$1.5 \times \text{IQR} = 1.5 \times 3.8 = 5.7$ LQ – 5.7 = –ve, UQ + 5.7 = 12.1 i.e. > 10 So no outliers AG	M1 A1	Attempt to find $1.5 \times \text{IQR}$ and add to UQ or subt from LQ OR compare $1.5 \times \text{IQR}$ with gap 3.6 between UQ and max 10 Correct conclusion from correct working need both
4 (i)	$0.3 \times 0.72 + 0.7 \times x = 0.783$ $x = 0.81$	M1 A1 A1	Eqn with sum of two 2-factor probs = 0.783 Correct equation Correct answer

Page 5	Mark Scheme	Syllabus	Paper
	Cambridge International AS/A Level – May/June 2015	9709	62

(ii)	$P(S \text{ given not like}) = \frac{P(S \cap NL)}{P(NL)}$ $= \frac{0.3 \times 0.28}{0.3 \times 0.28 + 0.7 \times 0.19} \text{ or } 1 - 0.783$ $= 0.387 \text{ (12/31)}$	B1 M1 A1 A1	0.3×0.28 seen on its own as num or denom of a fraction Attempt at P(NL) either (0.3 × p ₁) + (0.7 × p ₂) or 1 – 0.783 seen anywhere Correct unsimplified P(NL) as num or denom of a fraction Correct answer								
5 (i)	$P(2Es 1O) = \frac{3}{5} \times \frac{2}{4} \times \frac{2}{3} \times {}^3C_2 = \frac{3}{5} \text{ (0.6)}$ <p>OR</p> $P(2Es 1O) = \frac{{}^3C_2 \times {}^2C_1}{{}^5C_3} = \frac{6}{10}$ $= 0.6$ <p>OR</p> <p>241, 247, 261, 267, 461, 467 = 6 options 124 126 127 146 147 167 246 247 267 467</p> <p>Prob = 6/10</p>	M1 M1 A1	5×4×3 seen in denom Mult a prob by ³ C ₂ oe Correct answer ³ C _x or ^y C ₂ or ² C ₁ oe seen mult by k ≥ 1 in num ⁵ C ₃ seen in denom Correct answer M1 M1 A1 List at least 3 of 241, 247, 261, 267, 461, 467 ⁵ C ₃ or list to get all 10 options in denom see below Correct answer								
(ii)	<p>124 126 127 146 147 167 246 247 267 467</p> <table border="1" data-bbox="260 1211 732 1279"> <tr> <td>s</td> <td>1</td> <td>2</td> <td>4</td> </tr> <tr> <td>P(S=s)</td> <td>6/10</td> <td>3/10</td> <td>1/10</td> </tr> </table>	s	1	2	4	P(S=s)	6/10	3/10	1/10	M1 A1 B1 B1 B1	Attempt at listing with at least 7 correct All correct and no others or all 60 1, 2, 4 only seen in top row Any two correct All correct
s	1	2	4								
P(S=s)	6/10	3/10	1/10								
6 (a) (i)	<p>N*****B</p> $\text{Number of ways} = \frac{5!}{3!}$ $= 20$	B1 B1 B1	5! Seen in num oe or alone mult by k ≥ 1 3! Seen in denom can be mult by k ≥ 1 Correct final answer								
(ii)	<p>B(AAA)NNS</p> $\text{Number of ways} = \frac{5!}{2!} \text{ or } {}^5P_3$ $= 60$	M1 M1 A1	5! seen as a num can be mult by k ≥ 1 Dividing by 2! Correct final answer								
(b)	${}^{14}C_9 \text{ total options} = 2002$ <p>T and M both in ${}^{12}C_7 = 792$ Ans 2002 – 792 = 1210</p> <p>OR</p> <p>Neither in ${}^{12}C_9 = 220$ One in ${}^{12}C_8 = 495$ Other in ${}^{12}C_8 = 495$</p>	M1 B1 A1	${}^{14}C_9$ or ${}^{14}P_9$ in subtraction attempt ${}^{12}C_7$ (792) seen Correct final answer M1 B1 Summing 2 or 3 options at least 1 correct condone ${}^{12}P_9 + {}^{12}P_8 + {}^{12}P_8$ here only Second correct option seen accept another 495 or if M1 not awarded, any correct option								

Page 6	Mark Scheme	Syllabus	Paper
	Cambridge International AS/A Level – May/June 2015	9709	62

	total = 1210	A1	Correct final answer
7 (a) (i)	$\text{prob} = P\left(z < \frac{30 - 35.2}{4.7}\right)$ $= P(z < -1.106)$ $= 1 - 0.8655 = 0.1345$ $0.1345 \times 52 = 6.99$	M1 M1 A1 A1	Standardising no sq rt no cc no sq 1 - Φ Correct ans rounding to 0.13 Correct final answer accept 6 or 7 if 6.99 not seen but previous prob 0,1345 correct
(ii)	$\Phi(t) = 0.648 \quad z = 0.380$ $0.380 = \frac{t - 35.2}{4.7}$ $t = 37.0$	B1 M1 A1	0.648 seen standardising allow cc, sq rt, sq, need use of tables not 0.148, 0.648, 0.352, 0.852 correct answer rounding to 37.0
(b)	$\frac{7 - \mu}{\sigma} = -0.8 \quad \text{so} \quad 7 - \mu = -0.8\sigma$ $\frac{10 - \mu}{\sigma} = 0.44 \quad \text{so} \quad 10 - \mu = 0.44\sigma$ $\mu = 8.94 \quad \sigma = 2.42$	B1 B1 M1 M1 A1	± 0.8 seen ± 0.44 seen An eqn with z-value, μ and σ no sq rt no cc no sq Sensible attempt to eliminate μ or σ by subst or subtraction, need at least one value Correct answers