



Pearson

## **Mark Scheme (Results)**

January 2017

Pearson Edexcel Level 1 Award  
in Statistical Methods (AST10)

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## NOTES ON MARKING PRINCIPLES

- 1** All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.
- 2** Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.
- 3** All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e if the answer matches the mark scheme. Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme.
- 4** Where some judgement is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.
- 5** Crossed out work should be marked UNLESS the candidate has replaced it with an alternative response.
- 6** Mark schemes will indicate within the table where QWC is being assessed. The strands are as follows:
  - i) *ensure that text is legible and that spelling, punctuation and grammar are accurate so that meaning is clear*  
Comprehension and meaning is clear by using correct notation and labeling conventions.
  - ii) *select and use a form and style of writing appropriate to purpose and to complex subject matter*  
Reasoning, explanation or argument is correct and appropriately structured to convey mathematical reasoning.
  - iii) *organise information clearly and coherently, using specialist vocabulary when appropriate.*  
The mathematical methods and processes used are coherently and clearly organised and the appropriate mathematical vocabulary used.

## **7 With working**

If there is a wrong answer indicated on the answer line always check the working in the body of the script (and on any diagrams), and award any marks appropriate from the mark scheme.

If working is crossed out and still legible, then it should be given any appropriate marks, as long as it has not been replaced by alternative work.

If it is clear from the working that the "correct" answer has been obtained from incorrect working, award 0 marks. Send the response to review, and discuss each of these situations with your Team Leader.

If there is no answer on the answer line then check the working for an obvious answer.

Any case of suspected misread loses A (and B) marks on that part, but can gain the M marks. Discuss each of these situations with your Team Leader.

If there is a choice of methods shown, then no marks should be awarded, unless the answer on the answer line makes clear the method that has been used.

## **8 Follow through marks**

Follow through marks which involve a single stage calculation can be awarded without working since you can check the answer yourself, but if ambiguous do not award.

Follow through marks which involve more than one stage of calculation can only be awarded on sight of the relevant working, even if it appears obvious that there is only one way you could get the answer given.

## **9 Probability**

Probability answers must be given as fractions, percentages or decimals. If a candidate gives a decimal equivalent to a probability, this should be written to at least 2 decimal places (unless tenths).

Incorrect notation should lose the accuracy marks, but be awarded any implied method marks.

If a probability answer is given on the answer line using both incorrect and correct notation, award the marks.

If a probability fraction is given then cancelled incorrectly, ignore the incorrectly cancelled answer.

### **Guidance on the use of codes within this mark scheme**

M1 – method mark

A1 – accuracy mark

B1 – Working mark

C1 – communication mark

QWC – quality of written communication

oe – or equivalent

cao – correct answer only

ft – follow through

sc – special case

dep – dependent (on a previous mark or conclusion)

indep – independent

isw – ignore subsequent working

awrt – answer which rounds to

**PAPER: AST10\_01**

<b>Question</b>	<b>Working</b>	<b>Answer</b>	<b>Mark</b>	<b>Notes</b>
1 (ai)		unlikely	2	B1 cao
(aii)		impossible		B1 cao
(b)		cross marked at 1	1	B1 cao
(c)		0.5	1	B1 for 0.5 oe
2 (a)		Gala	1	B1 cao
(b)		4	1	B1 cao
(c)		Bedford (and) Pimlico	1	B1 cao
(d)		79	1	B1 cao
3 (a)		December	1	B1 cao
(b)		25	2	M1 for $2.5 \times 10$ oe A1 cao
(c)		170	2	M1 for $25 + 20 + 60 + 35 + 30$ or $17 \times 10$ oe condone one error A1 cao

PAPER: AST10_01				
Question	Working	Answer	Mark	Notes
4 (a)		[RB], RG, RP, BG, BP, GP	2	B2 cao ignore repeats and extras (B1 for 4 correct ignore repeats and extras)
(b)		$\frac{1}{6}$	1	B1 for $\frac{1}{6}$ oe or ft their part a
5		three things identified	3	B3 for three things identified from: 1. no title 2. no zero (on frequency axis) 3. non-linear (frequency) axis scale 4. overlapping intervals 5. one bar is shaded 6. bars have different widths (B2 for two correct B1 for one correct)
6 (ai)		true	2	B2 for all three correct (B1 for two correct)
(aii)		false		
(aiii)		true		
(b)		two things wrong	2	B1 for unsuitable question, accept no units (of distance) B1 for options too vague oe

PAPER: AST10_01				
Question	Working	Answer	Mark	Notes
7		spinner + correct reason correct reason	2	M1 for (spinner) A A1 for $\frac{3}{6} > \frac{3}{8}$ oe or greater proportion of black oe
		The probabilities are both $\frac{1}{6}$	1	B1 for e.g. both equal $\frac{1}{6}$
8		dual bar chart	4	B1 for correct bars for Male B1 for correct bars for Female (or B1 for 4 correct pairs of bars for Males and Females)  B1 for correct labelling on carriage axis B1 for correct key
9		4 heads, 11 tails	2	M1 for 4 heads or 11 tails or heads + tails = 15 A1 for 4 heads and 11 tails
		$\frac{4}{15}$	2	B1 for $\frac{4}{15}$ or ft part a oe
		not enough spins		B1 for not enough spins oe
10		28  315 10	4	M1 for $45 - 17 (=28)$ A1 for 28 B1 for 315 B1 for 10
		comparison of means	2	M1 for $330 \div '10' (=33)$ or $'315' \div 10 (=31.5)$ A1 ft for 33 and 31.5 and mean BD > mean PD oe



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Question	Working	Answer	Mark	Notes
11 (a)		29	1	B1 cao
(b)		29 38, 27, 23 19 71, 257	3	B3 cao (B2 for 27 or 71 B1 for 29 or 38 or 19 or 257)
(ci)		categorical	2	B1 cao
(cii)		discrete		B1 cao
12 (a)		15	1	B1 cao
(b)		151	1	B1 cao
(c)		28 + correct comparison	3	M1 for 165 – 137 or 165 and 137 seen together A1 for 28 B1 for correct comparison, eg they are the same
13 (a)		39	2	M1 for 22, 25, 28, 35, 43, 45, 50, 57 or for identifying 35 and 43 A1 cao
(b)		9375	2	M1 for $75\,000 \div 8 (=9375)$ condone one error in addition A1 cao
(c)		scatter graph	2	B2 for correctly plotting (50, 8000), (28, 11 000), (22, 12 000), (45, 8000), (43, 9000), (35, 10 000), (57, 6000) (B1 for 3 or 4 or 5 or 6 points plotted correctly)
(d)		negative	1	B1 for negative (correlation)
(e)		9000 – 10 000	1	B1 for answer in range 9000 – 10 000

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Question	Working	Answer	Mark	Notes
14 (a)		upwards	1	B1 for upwards oe
(b)		80	2	M1 for 1450 or 1370 A1 cao
(c)		5670	2	M1 for 1350 + 1520 + 1450 + 1350 (=5670) condone one error A1 cao
15 (a)		data collection sheet	3	M1 for a data collection sheet with label for colour or labels for yellow, orange and white oe A1 for label for tallies oe A1 for label for frequency oe
(b)		0.73	2	M1 for 1 – 0.27 (=0.73) A1 for 0.73 oe
(c)		0.65	2	M1 for 0.27 + 0.38 (=0.65) A1 for 0.65 oe
16 (a)		40	2	M1 for $\frac{361}{3249} \times 360$ oe (=40) A1 for 40 from correct working
(b)		1056	2	M1 for $\frac{117}{360} \times 3249$ oe (=1055.925) or ft part a A1 for answer in range 1051 – 1061

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Question	Working	Answer	Mark	Notes
17 (a)		frequency 4, 11, 8, 2 total 25	3	M1 for using tallies or correct frequencies A1 for at least one correct frequency or tallies A1 cao
(b)		$\frac{15}{25}$	2	M1 for ('4' + '11') / '25' A1 for $\frac{15}{25}$ oe or ft part a









