

Rewarding Learning

ADVANCED SUBSIDIARY (AS) General Certificate of Education 2017

### **Mathematics**

Assessment Unit S1 assessing Module S1: Statistics 1

## 

**Centre Number** 

**Candidate Number** 

\*AMS11\*

### [AMS11] TUESDAY 30 MAY, MORNING

#### TIME

1 hour 30 minutes.

#### INSTRUCTIONS TO CANDIDATES

Write your Centre Number and Candidate Number in the spaces provided at the top of this page.

You must answer all seven questions in the spaces provided.

Do not write outside the boxed area on each page or on blank pages.

Complete in black ink only. Do not write with a gel pen.

Questions which require drawing or sketching should be completed using an H.B. pencil. All working should be clearly shown in the spaces provided. Marks may be awarded for partially correct solutions. **Answers without working may not gain full credit**. Answers should be given to three significant figures unless otherwise stated. You are permitted to use a graphic or scientific calculator in this paper.

#### INFORMATION FOR CANDIDATES

The total mark for this paper is 75

Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.

A copy of the **Mathematical Formulae and Tables booklet** is provided.

Throughout the paper the logarithmic notation used is  $\ln z$  where it is noted that  $\ln z \equiv \log_e z$ 10462

## 

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|   | Find the probability that in a school week he will be late exactly twice. |
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| Find Bob's expected weekly pocket money. | [4    |
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| 2 | A discrete ra | indom variable | Xhas | distribution | given | in <b>Table</b> | 1 below. |
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| x         -2         -1         0         1         2           P(X=x)         a         0.16         0.16         b         0.08           iiven that $E(X) = -0.12$ )         find the values of a and b | x         -2         -1         0         1         2           P(X=x)         a         0.16         0.16         b         0.08           iven that $E(X) = -0.12$ if ind the values of a and b |               |                       | Tab  | le 1 |          |      |
|--|---|---------------|-----------------------|------|------|----------|------|
| P(X = x)         a         0.16         0.16         b         0.08           liven that $E(X) = -0.12$ )         find the values of a and b   | P(X=x)         a         0.16         0.16         b         0.08           iven that $E(X) = -0.12$  | x             | -2                    | -1   | 0    | 1        | 2    |
| iven that E( <i>X</i> ) = -0.12 ) find the values of <i>a</i> and <i>b</i>   | iven that $E(X) = -0.12$<br>find the values of <i>a</i> and <i>b</i>  | P(X=x)        | a                     | 0.16 | 0.16 | b        | 0.08 |
| ) find the values of a and b   | find the values of a and b  | iven that E(2 | K) = -0.12            |      |      | <u>.</u> |      |
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4 Pauline is analysing information about the times spent parked in a hospital car park. She has misplaced her original data but still has the cumulative frequency table, shown in **Table 2** below.

| Tim       | ne (hours)           | < 0.5                                   | < 1.0      | < 1.5        | < 2.0    | < 2.5 | < 3.0  |
|-----------|----------------------|---|------------|--------------|----------|-------|--------|
| Cur       | nulative frequency   | 38                                      | 87         | 154          | 207      | 235   | 250    |
| <b>i)</b> | Find an estimate for | the media                               | n time spe | nt in the ca | ar park. |       | [(     |
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|       |                   | Normal distribution values should be read from the tables provided.  |   |
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| 5     | The<br>star       | e scores of an aptitude test are normally distributed with mean 150 and indard deviation 20  |   |
|       | Suc<br>The<br>Onl | ecessful candidates are awarded a 'pass', 'merit' or 'distinction'.<br>e pass mark is 120 and 165 is needed for a 'merit'.<br>by the top 5% of candidates are awarded a 'distinction'. |   |
|       | (i)               | Find the percentage of candidates awarded a 'pass'. [6   | ] |
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| 11) | Find the minimum mark needed to be awarded a 'distinction'. | [   |
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| The | probability density function of X is given by |   |
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|     | $f(x) = kx(1-x)^2 \qquad 0 \le x \le 1$       |   |
| (i) | Show that $k = 12$                            | [ |
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| (i) | Find the probability that two are sold by lunchtime (half a day). | [     |  |  |  |
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