Edexcel GCE
Statistics S1
Bronze Level B3
(Question Paper)

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Paper Reference(s)

6683/01

Edexcel GCE

Statistics S1

Bronze Level B3

Time: 1 hour 30 minutes

Materials required for examination papers	**Items included with question**
Mathematical Formulae (Green)	Nil

Candidates may use any calculator allowed by the regulations of the Joint Council for Qualifications. Calculators must not have the facility for symbolic algebra manipulation, differentiation and integration, or have retrievable mathematical formulas stored in them.

Instructions to Candidates

Write the name of the examining body (Edexcel), your centre number, candidate number, the unit title (Statistics S1), the paper reference (6683), your surname, initials and signature.

Information for Candidates

A booklet 'Mathematical Formulae and Statistical Tables' is provided.
Full marks may be obtained for answers to ALL questions.
There are 7 questions in this question paper. The total mark for this paper is 75.

Advice to Candidates

You must ensure that your answers to parts of questions are clearly labelled.
You must show sufficient working to make your methods clear to the Examiner. Answers without working may gain no credit.

Suggested grade boundaries for this paper:

A*	A	B	C	D	E
72	66	59	52	46	41

1. The volume of a sample of gas is kept constant. The gas is heated and the pressure, p, is measured at 10 different temperatures, t. The results are summarised below.

$$\Sigma p = 445 \qquad \Sigma p^2 = 38\,125 \qquad \Sigma t = 240 \qquad \Sigma t^2 = 27\,520 \qquad \Sigma pt = 26\,830$$

(a) Find S_{pp} and S_{pt} .

(3)

Given that $S_{tt} = 21\,760$,

(b) calculate the product moment correlation coefficient.

(2)

(c) Give an interpretation of your answer to part (b).

(1)

May 2009

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2. Keith records the amount of rainfall, in mm, at his school, each day for a week. The results are given below.

2.8 5.6 2.3 9.4 0.0 0.5 1.8

Jenny then records the amount of rainfall, x mm, at the school each day for the following 21 days. The results for the 21 days are summarised below.

$$\sum x = 84.6$$

(a) Calculate the mean amount of rainfall during the whole 28 days.

(2)

Keith realises that he has transposed two of his figures. The number 9.4 should have been 4.9 and the number 0.5 should have been 5.0.

Keith corrects these figures.

(b) State, giving your reason, the effect this will have on the mean.

(2)

January 2011

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3. The age in years of the residents of two hotels are shown in the back to back stem and leaf diagram below.

Abbey Hotel 8 | 5 | 0 means 58 years in Abbey Hotel and 50 years in Balmoral Hotel Balmoral Hotel

(1)	2	0		
(4)	9 7 5 1	1		
(4)	9 8 3 1	2	6	(1)
(11)	9 9 9 9 7 6 6 5 3 3 2	3	4 4 7	(3)
(6)	9 8 7 7 5 0	4	0 0 5 5 6 9	(6)
(1)	8	5	0 0 0 0 1 3 6 6 7	(9)
		6	2 3 3 4 5 7	(6)
		7	0 1 5	(3)

For the Balmoral Hotel,

(*a*) write down the mode of the age of the residents,

(1)

(*b*) find the values of the lower quartile, the median and the upper quartile.

(3)

(*c*) (i) Find the mean, $\bar{x}$, of the age of the residents.

(ii) Given that $\sum x^2 = 81\,213$, find the standard deviation of the age of the residents.

(4)

One measure of skewness is found using

$$\frac{\text{mean} - \text{mode}}{\text{standard deviation}}$$

(*d*) Evaluate this measure for the Balmoral Hotel.

(2)

For the Abbey Hotel, the mode is 39, the mean is 33.2, the standard deviation is 12.7 and the measure of skewness is –0.454.

(*e*) Compare the two age distributions of the residents of each hotel.

(3)

May 2008

4. Crickets make a noise. The pitch, v kHz, of the noise made by a cricket was recorded at 15 different temperatures, t °C. These data are summarised below.

$$\sum t^2 = 10\,922.81, \quad \sum v^2 = 42.3356, \quad \sum tv = 677.971, \quad \sum t = 401.3, \quad \sum v = 25.08$$

(*a*) Find S_{tt}, S_{vv} and S_{tv} for these data.

(4)

(*b*) Find the product moment correlation coefficient between t and v.

(3)

(*c*) State, with a reason, which variable is the explanatory variable.

(2)

(*d*) Give a reason to support fitting a regression model of the form $v = a + bt$ to these data.

(1)

(*e*) Find the value of a and the value of b. Give your answers to 3 significant figures.

(4)

(*f*) Using this model, predict the pitch of the noise at 19 °C.

(1)

May 2008

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5. There are 180 students at a college following a general course in computing. Students on this course can choose to take up to three extra options.

112 take systems support,
70 take developing software,
81 take networking,
35 take developing software and systems support,
28 take networking and developing software,
40 take systems support and networking,
4 take all three extra options.

(*a*) Draw a Venn diagram to represent this information.

(5)

A student from the course is chosen at random.

Find the probability that the student takes

(*b*) none of the three extra options,

(1)

(*c*) networking only.

(1)

Students who want to become technicians take systems support and networking. Given that a randomly chosen student wants to become a technician,

(*d*) find the probability that this student takes all three extra options.

(2)

January 2010

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6. The following shows the results of a wine tasting survey of 100 people.

96 like wine *A*,
93 like wine *B*,
96 like wine *C*,
92 like *A* and *B*,
91 like *B* and *C*,
93 like *A* and *C*,
90 like all three wines.

(*a*) Draw a Venn Diagram to represent these data.

(6)

Find the probability that a randomly selected person from the survey likes

(*b*) none of the three wines,

(1)

(*c*) wine *A* but not wine *B*,

(2)

(*d*) any wine in the survey except wine *C*,

(2)

(*e*) exactly two of the three kinds of wine.

(2)

Given that a person from the survey likes wine *A*,

(*f*) find the probability that the person likes wine *C*.

(3)

January 2008

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7. A manufacturer carried out a survey of the defects in their soft toys. It is found that the probability of a toy having poor stitching is 0.03 and that a toy with poor stitching has a probability of 0.7 of splitting open. A toy without poor stitching has a probability of 0.02 of splitting open.

(*a*) Draw a tree diagram to represent this information.

(3)

(*b*) Find the probability that a randomly chosen soft toy has exactly one of the two defects, poor stitching or splitting open.

(3)

The manufacturer also finds that soft toys can become faded with probability 0.05 and that this defect is independent of poor stitching or splitting open. A soft toy is chosen at random.

(*c*) Find the probability that the soft toy has none of these 3 defects.

(2)

(*d*) Find the probability that the soft toy has exactly one of these 3 defects.

(4)

May 2012

TOTAL FOR PAPER: 75 MARKS

END