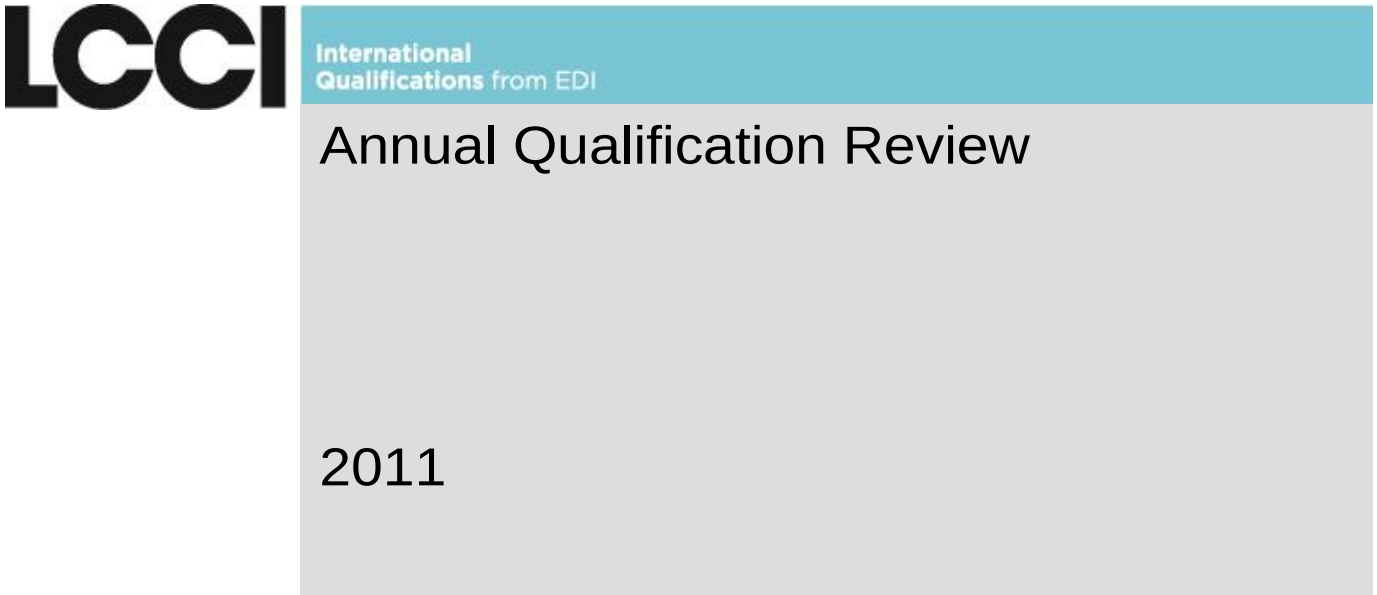
Level 2 Certificate in Business Statistics



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INTRODUCTION

The annual qualification review provides qualification–specific support and guidance to centres. This information is designed to help teachers preparing to teach the subject and to help candidates preparing to take the examination.

The reviews are published in September and, in this case, take into account candidate performance, demonstrated in the Series 3 2011 examination. Global pass rates are published so you can measure the performance of your centre against these.

The review identifies candidate strengths and weaknesses by syllabus topic area and provides examples of good and poorer candidate responses. It should therefore be read in conjunction with details of the structure and learning objectives contained within the syllabus for this qualification found on the website.

The review also identifies any actual or proposed changes to the syllabus or question types together with their implications.

PASS RATE STATISTICS

The following statistics are based on the performance of candidates who took this qualification between 1 October 2010 and 31 August 2011.

Global pass rate 61.74%

Grade distributions

Pass	35.89%
Credit	41.26%
Distinction	22.85%

GENERAL STRENGTHS AND WEAKNESSES

Strengths

Improvement has been evident in:

- Good analytical skills shown

Weaknesses

- Graphs/charts are not always drawn accurately or in certain cases the correct type is not selected
- Certain areas of the syllabus are not well covered .These include probability, aspects of sample design and data collection methods plus data interpretation and inferential statistics.

TEACHING POINTS BY SYLLABUS TOPIC

1.1.7 Commentaries on graphs/diagrams and summary statistics.
1.2.1 Differentiating primary and secondary sources of data.
1.2.4 Review alternative sampling methods emphasising advantages and disadvantages of each.
2.1.2 Correct presentation of graphs/charts eg. cf.curve plotted at upper limits.
3.1.7 Dealing with tied ranks in the context of Spearman's rank correlation coefficient.
4.1.3 Correct application of addition/multiplication rules of probability.

1.1 GRAPHICAL PRESENTATION OF DATA.

Section 1.1 More care needs to be taken in drawing suitable graphs with proper attention paid to scaling, labelling, titles and stating the source of the data.

1.2 SURVEY METHODOLOGY.

Section1.2 terms such as stratification and sample frame are not well understood. Additionally candidates show little knowledge of alternative methods of data collection such as interviewing, telephone contacts etc.

2.1-2.3 MEASURES OF LOCATION AND DISPERSION

Sections 2.1/.2/.3 are generally well attempted as these parts are very heavily technique based. The main weaknesses are in the drawing of histograms with uneven class intervals and in the correct identification of the quartile deviation and mean deviation.

3.1 CORRELATION AND REGRESSION

Section 3.1 Most are able to understand and apply the basic methods for example, finding the correlation coefficient. The difficulty arises when the question requires interpretation of findings.

3.2 TIME SERIES ANALYSIS

This also applies to Section 3.2 where there is a basic understanding of the techniques evident but a failure to explain whether for example, estimated forecasts are likely to be correct.

4.1 PROBABILITY

Section 4.Candidates either fully understand probability or have not covered this topic in sufficient detail to achieve a satisfactory mark on the questions. The main weaknesses are in applying the rules correctly and considering all relevant outcomes.

FURTHER GUIDANCE

- More emphasis should be placed on data collection methods with justification for their use
- This should include reference to advantages and disadvantages of using a given method
- Together with an understanding of when a particular method is appropriate
- Similarly with sampling methods. Candidates need a full understanding of how to select random samples, the arguments for and against using different sampling methods and the role of stratification in sample design
- More care needs to be taken in the drawing of diagrams .There are many basic errors seen in labelling, scaling and the plotting of points
- Levels of expected accuracy to statistical calculations must be recognised. Normally answers should be to at least 2dp. but for example, in the case of index number calculations, answers should be rounded to 1dp
- Probability rules (addition and multiplication) need to be understood including when to apply either rule. Additionally it is useful to encourage candidates to list alternative ways of achieving a given outcome .This can be carried out using Venn or Tree diagrams
- Emphasis needs to be placed on data interpretation. This will include looking for example, trends/patterns within a data set or suggesting additional data that needs to be collected.

EXAMPLES OF CANDIDATE RESPONSES

QUESTION 1

A company assembling office chairs uses three main materials: metal tubing, foam and cloth.

The table shows the prices per metre (in £), and the quantity of each material used (in metres) in the assembly process, during 2006 and 2010.

	Metal tubing		Foam		Cloth	
Year	Price (£)	Quantity (metres)	Price (£)	Quantity (metres)	Price (£)	Quantity (metres)
2006	4.60	1900	1.80	4000	2.00	2400
2010	5.10	1780	3.20	3600	1.70	4200

(a) Calculate the Laspeyre price index for 2010 with 2006 as base year.

(6 marks)

(b) Calculate the Paasche price index for 2010 with 2006 as base year.

(6 marks)

(c) Interpret what the two results show and explain why the two indices have different values.

(4 marks)

The following table shows the number of units produced by the company over a recent three week period.

The company works a five day week.

	Units Produced				
	Monday	**Tuesday**	**Wednesday**	**Thursday**	**Friday**
Week 1	34	40	44	42	38
Week 2	37	44	47	45	40
Week 3	39	46	69	48	42

(d) Calculate the five point moving average trend values for these data.

(5 marks)

(e) Explain why a five point moving average is appropriate in this case.

(2 marks)

(f) Give **two** comments on the patterns shown in the numbers of units produced over the three week period.

(2 marks)

(Total 25 marks)

Answer A – High Response

HIGH RESPONSE EXAMPLE

Q1(a)

	$P_n Q_0$	$P_0 Q_0$
Tubing	$5.1 \times 1900 = 9690$	8740
Foam	$3.2 \times 4000 = 12800$	7200
Cloth	$1.7 \times 2400 = 4080$	4800
	26570	20740

$$\text{Lasp} = \frac{\Sigma P_n Q_0}{\Sigma P_0 Q_0} \times 100 = \frac{26570}{20740} \times 100 = 128.1$$

(b)

$P_n Q_n = 9078 + 11520 + 7140 = 27738$

$P_0 Q_n = 8188 + 6480 + 8400 = 23068$

$$\text{Paasche} = \frac{27738}{23068} \times 100 = 120.2$$

(c) prices rose by 28.1% and 20.2%
cloth has a ~~higher~~ lower weight.

(d) Total in 5's

198 201 205 208 211 213 215 217
239 242 244

÷5

Wk 1	Wed	39.6	40.2	41	41.6	42.2	42.6
~~44~~	43	43.4	47.8	48.4	48.8		

(e) There are ~~7~~ 5 days in a working week.

(f) trend upward.

SCRIPT A (DISTINCTION)

Parts (a and b) candidate gives a correct response with clear evidence of workings and answer expressed to 1dp. [12 marks]

Part (c) only one suitable comment in answer, price increases both quoted. [2 marks]

Part (d) fully correct trend but not labelled. [4 marks]

Part (e) correct comment. [2 marks]

Part (f) one comment only. [1 mark]

TOTAL 21 MARKS

Answer B – Medium Response

MEDIUM RESPONSE EXAMPLE

1(a) Current price × base qty = 9690 + 12800 + 4080
= 26570

base price × base qty = 8740 + 7200 + 4800
= 20740

Index $\frac{26570}{20740} \times 100 = 128.10993$

(b) cp × cq = 9078 + 11520 + 7140 = ~~2738~~ 27738

bp × cq = 8188 + 6480 + 8400 = 23068

$23068 / 27738 \times 100 = 83.164$

(c) different quantities used

(d)

198	39.6
201	40.2
205	41.0
208	41.6
211	42.2
213	42.6
215	43.0
217	43.4
239	47.8
242	48.4
244	48.8

(e) Averages over the year.

(f) Most is produced on Wednesdays

SCRIPT B (PASS)

Part (a) correct response but not to 1dp. [5 marks]

Part (b) formula and substitution wrong way around [4 marks]

Part (c) vague reference only to different weights. [1 mark]

Part (d) trend correct but not labelled. [4 marks]

Part (e) incorrect statement. [0 mark]

Part (f) one comment on mid-week peak. [1 mark]

TOTAL 15 MARKS

Answer C – Low Response

LOW RESPONSE EXAMPLE

1a $9690/8140 = 1.108$ $12800/7200 = 1.77$

$4080/4800 = 0.85$ $= 3.728$

$\frac{\Sigma P_n Q_0}{\Sigma P_0 Q_0} \times 100 = 3.728 \times 100 = 372.8$

(b) $P_n Q_0 = 3.728$

$P_0 Q_n = 8188 + 6480 + 8400 = 23068$

$3.728/23068 \times 100 = .016$

(c) prices rise

(d)

W	198 ÷ 5	39.6
T	201	40.2
F	205	41.0
M	208	41.9
T	211	42.4
W	213	42.6
T	215	43
F	217	43.4
M	239	47.1
T	242	48.4
W	244	48.8

(e) ———

(f) Week 3 Wednesday is highest.

SCRIPT C (FAIL)

Part (a) correct formula but substitution wrong. [1 mark]

Part (b) formula wrong but denominator correct. [2 marks]

Part (c) mark for comment on increase only; no justification given. [1mark]

Part (d) add in 5's correct; error on trend and not labelled. [3 marks]

Part (e) statement missing. [0 mark]

Part (f) comment on week 3 Wednesday correct. [1 mark]

TOTAL 8 MARKS

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