

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 2 2008 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 2008 and 30 September 2009.

Global pass rate 64.59%

Grade distributions

Pass 29.32%

Credit 26.76%

Distinction 8.51%

GENERAL STRENGTHS AND WEAKNESSES

Strengths

- Regression analysis,
- graphical presentation of data,
- measures of location and dispersion
- Spearman's coefficient and index numbers.

Weaknesses

- Conversion of grouped data into a continuous form,
- survey methodology
- Interpretation of diagrams/graphs and summary measures.

TEACHING POINTS BY SYLLABUS TOPIC

1.1 GRAPHICAL PRESENTATION OF DATA.

All graphs need to be correctly scaled with appropriate labels and title.

Candidates must ensure the diagram requested is drawn this particularly applies to bar charts where a number of alternatives are available e.g. simple, multiple, component etc. and where the differences between each are not fully understood. Answers to Question 5 (a) frequently showed the incorrect use of component rather than multiple bar charts drawn.

Where a question requires interpretation of a chart/graph comments should cover both the overall pattern present, plus any individual component changes that are evident.

The distinction between presentation of data in discrete or continuous form needs to be emphasised. Answers often show continuous data in discrete blocks having failed to apply the continuity correction in such cases [see Question 1(a)]

1.2 SURVEY METHODOLOGY.

Candidates need to be fully aware of the range of sampling methods available and the requirements necessary to apply a given method such as the need for a comprehensive sample frame prior to undertaking random sampling.

Additionally they should recognise the constraints such as time and cost which may limit the use of certain types of sampling method. These should be considered alongside other factors, including sample bias and sample size [see Question 4 (c)]

Also candidates should be able to describe and explain the different types of data collection methods in use, these include direct interviews, postal surveys, e-mails etc. The advantages and disadvantages of each of these methods should also be understood.

Candidates experience significant problems in attempting to answer questions on this part of the syllabus.

2.1-2.3 MEASURES OF LOCATION AND DISPERSION

The distinction between each of the summary measures needs to be emphasised, together with the methods used to estimate these measures, dependent on whether the data is in raw or grouped form [see Question 3(b)] Additionally the effect on the measures of adding or subtracting a constant to the data set needs to be considered [see Question 3(d)]

The use of graphical methods to estimate for example, median, quartiles or mode should also be reviewed [see Question 1(b)]

Throughout candidates need to be aware of the limitations and uses of each measure and how a given result maybe affected by the form of data grouping used.

Levels of accuracy for the final answer should be appropriate to the context of the question, often to at least 2dp.

Formulae for certain summary measures are provided with the question paper and should be used as required.

2.4 INDEX NUMBERS.

The purpose, construction and use of some of the main official indices e.g the RPI. need to be fully understood [see Questions 6(a/b)]

Additionally the different methods used to construct weighted indices should be covered, together with their advantages and disadvantages. This section should include aggregate price and quantity indices using either base or current year weighting methods.

Candidates must be able to interpret what the index measure shows e.g. an increase in the price index is often linked to fall in the quantity index.

Index numbers should normally be expressed to 1d.p.

3.1 CORRELATION AND REGRESSION.

For regression analysis it is important to distinguish dependent and independent variables. This will then ensure the correct form for the scatter diagram and the regression equation [see Questions 2(a/f)]

Interpretation of the scatter diagram to assess the suitability or otherwise of fitting a regression line is an important first step in this type of analysis. Care must be taken in substituting correctly into the given formulae for slope and intercept.

The distinction between forecasting based on interpolation and/or extrapolation should also be clearly understood.

How to order data and deal with tied ranks are important issues when dealing with ordinal data, as is the correct use of Spearman's formula.

Candidates should note that answers fall within (± 1) and that the numerator must **not** be based on $(1 - 6\sum d^2)$ [see Question 4(a)]

Correct interpretation of the coefficient in context, is important e.g. a value of the coefficient equal to -0.92 implies strong negative correlation ie. one set of rankings is the reverse of the other [see Question 4(b)]

4.1 PROBABILITY

How to represent probability problems in tabular or diagrammatic form is critical.

The distinction between the addition and multiplication rules and when applied is also important.

Candidates should be able to list the ways in which a successful outcome can occur and link this to the correct use of the probability principles to arrive at a final answer.

Appropriate levels of accuracy should be used, specifically when probabilities are expressed in decimal form. A final answer to at least 3dp. is normally expected.

FURTHER GUIDANCE

No changes have been made to the original syllabus.

More emphasis needs to be placed on the development of a critical approach to presentation, analysis and interpretation of data.

Candidates should be aware that individual questions are designed to test a number of different syllabus topics, not just a single topic.

EXAMPLES OF CANDIDATE RESPONSES

Examples of candidate responses (high, medium, low with justification of assessment decisions)

Q1(a) Drawing a bar chart rather than a histogram (low).

Q2(a/b) Transposing x and y in the regression equation (medium).

Q3(a) Failing to provide examples of primary and secondary data sources (medium).

Q4(a) Incorrect substitution into the formula for Spearman's coefficient (medium).

Q5(a) Multiple bar chart not fully labelled (medium)

Q6(c) Using incorrect base year (medium): failing to weight price changes (low).

QUESTION 6 SERIES 2 2009 PAPER

- (a) What is measured by an index number? (2 marks)
- (b) State the main steps involved in the construction of an index of retail prices. (4 marks)

The sales manager of a clothing retail store recorded the average prices and the quantities sold of its four best selling product lines in 2006 and 2008, as follows:

Product	2006		2008	
	Items sold (00)	Price per item (£)	Items sold (00)	Price per item (£)
P	20	50	18	65
Q	15	100	12	145
R	7	80	9.5	100
S	4.5	125	6	105

- (c) Calculate for 2008, using 2006 as the base year, a Laspeyre price index **and** a Laspeyre quantity index. (11 marks)
- (d) Describe the changes in price and quantity sold between the two years. (4 marks)
- (e) State the main difference between the Laspeyre method and the Paasche method for calculating index numbers. (2 marks)
- (f) Give one advantage and one disadvantage in using the Paasche method to calculate a price index. (2 marks)

(Total 25 marks)

(a) CHANGES OVER TIME

(b) USED IN WAGE NEGOTIATION,
MEASURE RATE OF INFLATION,
TO FIND REAL INCOME
PURCHASE POWER OF CURRENCY

$$(c) P_0 Q_0 = 1000 + 1500 + 560 + 562.5 = 3622.5$$

$$P_0 Q_n = 900 + 1200 + 760 + 750 = 3610$$

$$P_n Q_0 = 1300 + 2175 + 700 + 472.5 = 4647.5$$

$$\text{LasPPI} = 3622.5 / 4647.5 = .779$$

$$\text{LasPQI} = 3622.5 / 3610 = 1.003$$

(d) QUANTITY NOT CHANGED.
PRICES FALLEN

(e) LASPEYRE BASE WEIGHTS
PAASCHE CURRENT WEIGHTS.

(f) UP TO DATE : BUT REQUIRES
QUANTITIES AND PRICES FOR
BOTH YEARS.

(a) changes in price and volume

(b) what to include, which to use as base year

$$(c) P_n Q_0 = 65 \times 20 + 145 \times 15 \dots$$
$$= 4649.5$$

$$P_0 Q_0 = 20 \times 50 + 15 \times 100 + 7 \times 80$$
$$+ 4.5 \times 125 = 3631$$

$$P_0 Q_n = 50 \times 18 + 100 \times 12 \dots$$
$$= 3610$$

$$\text{Laspeyres Price} = \frac{4649.5}{3631} \times 100 = 128.05$$

$$\text{Laspeyres Qty} = \frac{3610}{3631} \times 100 = 99.42$$

(d) price and quantity increase

(e) Laspeyres uses base weighting methods

Paasche current methods.

(f) shows changes using current prices or quantities as weights.

only compare with one year.

(a) shows changes in price and volume from year to year

(b) what goods to include, what is base, find the data, which formula?

$$\begin{aligned} \text{(c)} \quad & \text{current price} \times \text{base quantity} \\ & = 4647.5 \\ & \text{base price} \times \text{base quantity} \\ & = 3622.5 \\ & \text{current quantity} \times \text{current price} \\ & = 1170 + 1740 + 950 + 630 = 4490 \end{aligned}$$

$$\text{L.P.I} = \frac{4647.5}{3622.5} \times 100 = 128.3$$

$$\text{PQI} = \frac{4490}{4647.5} \times 100 = 96.6$$

(d) price increase, quantity falls

(e) Laspeyre uses base weights

(f) shows price change up to date only compare with one year, base

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