LCCI Level 3 Certificate in Business Statistics

Overview of content

1. Management Information: The External and Internal Business Environment
   Data collection
   Descriptive statistics

2. Business Planning Models
   Correlation and regression
   Time-based data

3. Risk Management and Business Decision Making
   Probability, including the normal distribution
   Estimation and confidence intervals
   Significance testing
   Chi squared test

4. Quality Assurance and Control
   Quality control

GROUP 1 – SELECT 20 (x4 marks each)

Qu 1	MRQ The accuracy of a sampling frame for collecting information depends on which of the following?	
A	The size of the sample	✔
B	The probability that the sample is representative of a population	✔
C	Timing of the research	
D	Small manageable sample numbers	

Qu 2	MRQ Which of the following would be considered external sources of information?	
A	Customer satisfaction	✔
B	Demographic data	✔
C	Purchasing data	
D	Financial data	

Qu 3	MATCH ITEMS Match the following descriptions to the appropriate method of collecting information.	
	Face-to-face interviews	Often the most accurate and effective form of data gathering but it is time consuming and expensive.
	Telephone interviews	Often considered intrusive and unwelcome, with some respondents unwilling to answer.
	Postal questionnaires	Cheap as these save on travel costs but response rates are usually low, which might lead to bias.
	Direct observations	Useful and convenient method that can also be combined with monitoring processes.

Qu 4	MRQ Sampling errors are most likely to occur in which of the following cases?	
A	There is a subjective choice in which items will be sampled.	✔
B	The sampling frame is not randomly organised.	✔
C	The sampling frame is complete.	
D	The sample is too rigidly adhered to.	

Qu 5	INSERT VALUE What is the mean value of the following information about the number of sales per day achieved by a salesperson? 0, 1, 4, 12, 10, 7, 8, 6	
A	6	✔

Qu 6	MCQ What is the median value of the following information about the number of sales per day of a salesperson? 0, 1, 4, 12, 10, 7, 8, 6	
A	7	
B	8	
C	7.5	
D	6.5	✔

Qu 7	MCQ For the following set of data, which of the statements below is correct? 3, 2, 1, 1, 2, 1, 32	
A	The mean is higher than the median value	✔
B	The mean is lower than the median value	
C	The median is higher than the mean value	
D	The mean and the median values are the same	

Qu 8	MCQ What is the standard deviation for the following set of data relating to the number of physiotherapy appointments booked on successive days? 3, 4, 7, 15, 13, 10, 11, 9	
A	3.9	✔
B	6.0	
C	0.9	
D	9.0	

Qu 9	MCQ On waiting lists for two different types of surgery, the following information is found: Those waiting for operation A have a mean waiting time of 17 weeks, with a standard deviation of 6 weeks. Those waiting for operation B have a longer mean waiting time of 44 weeks, with a standard deviation of 4 weeks. Which operation has the higher coefficient of variation?	
A	Operation A	✔
B	Operation B	
C	Both operations are the same	
D	It is not possible to say	

Qu 10	MCQ Under a Normal Distribution curve, what percentage of the area under the curve is covered by the mean ± two standard deviations?	
A	95.4	✔
B	99.7	
C	68.3	
D	77.9	

Qu 11	INSERT VALUE The production department of LD Ltd has gathered the following information about manufacturing levels and costs. Units manufactured (000s) / Production costs (£000) 1 — 5.0 2 — 10.5 3 — 15.5 4 — 25.0 5 — 16.0 6 — 22.5 Calculate the Spearman's rank correlation coefficient. (Give your answer to three decimal places.)	
A	0.829	

Qu 12	MCQ The production department of LD Ltd has gathered the following information about manufacturing levels and costs. Units manufactured (000s) X: 1, 2, 3, 4, 5, 6 Production costs (£000) Y: 5.0, 10.5, 15.5, 25.0, 16.0, 22.5 What is the regression equation for X and Y?	
A	Y = 3.2X + 4.4	✔
B	Y = 3.2X - 4.4	
C	Y = 4.6X + 9.7	
D	Y = 4.6X - 9.7	

Qu 13	MRQ For the Spearman's rank correlation, what values can the coefficient have?	
A	From 0 to +1	✔
B	From -1 to 0	✔
C	From +1 to +2	
D	Any positive number	

Qu 14	INSERT VALUE The following figures have been calculated for the advertising expenditure (x) and the sales numbers (y) of a business. $\sum x^2 = 81.93$ $\sum y^2 = 173.18$ $\sum xy = 102.28$ Using these figures, calculate the correlation coefficient. (Give your answer correct to two decimal places.)	
A	+0.86	

Qu 15	MCQ In the equation of the line of best fit, $y = a + bx$ linking the variables x and y, what is the correct description for the variable x?	
A	Independent variable	✔
B	Dependent variable	
C	Point of intersection on the vertical axis	
D	Gradient of the line	

Qu 16	MATCH ITEMS Match the following descriptions to the correct component of a time series analysis.	
	Trend	A pattern evident from the data gathered.
	Cyclical fluctuation	Regular high and low values seen over a period of time.
	Seasonal fluctuation	Variations observed at specific times of year.
	Random fluctuation	Peaks or troughs that occur as unexpectedly results.

Qu 17	MCQ The sales figures of a motorcycle dealership for eight years are shown below. Year Sales 2016 300 2017 500 2018 600 2019 550 2020 600 2021 750 2022 850 2023 1100 What would be the 5-year centred moving average be for 2018?	
A	510	✔
B	550	
C	525	
D	488	

Qu 18	MCQ What is the name given to the technique of smoothing out variations in data due to seasonal and cyclical factors?	
A	Moving averages	✔
B	Trend analysis	
C	Data forecasting	
D	Proportional modelling	

Qu 19	INSERT VALUE The following results were obtained from random checks of heavy goods vehicles during March 2025. These can be assumed to be representative of all goods vehicles on the roads. [see table below] What is the probability of selecting a vehicle at random that is either overweight or whose driver has exceeded the legal driving time, but not both?	
A	0.46	

	Overweight	Not overweight
Driving time exceeded	18	29
Driving time not exceeded	40	63

Qu 20	MCQ A component manufacturer knows from research that 3 components from every batch of 50 components is likely to be faulty. What is the probability of selecting two components (without replacement) from a batch that are faulty?	
A	0.002	✔
B	0.004	
C	0.02	
D	0.04	

Qu 21	MCQ For the effective use of a normal distribution, it is necessary to have at least how many observations within a sample?	
A	30	✔
B	5	
C	15	
D	50	

Qu 22	MCQ When calculating confidence levels, at what level of confidence with there be a 5% chance that the true mean lies outside the calculated limits?	
A	95%	✔
B	90%	
C	99.5%	
D	99.05%	

Qu 23	MCQ What name is given to the region of a chi-square distribution within which the hypothesis, H_o, would be rejected?	
A	The critical region	✔
B	The accepted region	
C	The rejected region	
D	The mean region	

Qu 24	MCQ What is the critical value of chi-square on four degrees of freedom at the 5% significance level?	
A	9.488	✔
B	0.9488	
C	94.88	
D	0.0948	

Qu 25	MRQ Which of the following are essential properties of effective estimates?	
A	Unbiased	✔
B	Sufficient	✔
C	Similar	
D	Measured	

Qu 26	INSERT VALUE PrintSmart Ltd is a company that prints wrappers for food products. The following information shows the profit margins recorded when different numbers of coloured inks are used for a range of products. Number of colours Profit margin (%) 4 15 5 12 4 11 6 16 3 9 5 16 7 18 6 16 8 20 6 17 What is the coefficient of correlation for these two variables? (Give you answer to three decimal places.)	
A	0.899	

Group 2 – select 10 questions (2 marks each)

Qu 27	INSERT VALUE For a normal distribution, the mean ± 1.96 x standard deviation covers what percentage of a population?	
A	95	

Qu 28	INSERT VALUE What is the range of the following monthly sales figures? January 1200 February 1360 March 1280 April 2050 May 1940 June 1980	
A	850	

Qu 29	DROP DOWN Both the range and the interquartile range are measures of (dispersion). However, the mean (deviation) is of limited use because positive and negative variations may cancel each other out.	
A	dispersion average, displacement, position	
B	deviation value, variance, data	
Qu 30	DROP DOWN Most of the information that flows through a business comes from the recording of (financial) activities and the monitoring of business processes, although this may be supported by data obtained from (outside) sources.	
A	financial marketing, management, customer	
B	outside internal, stakeholder, government	

Qu 31	TRUE OR FALSE a) The interquartile range considers the range within the central 50% of a set of data. b) The difference between the first quartile and the median provides the interquartile range.	
A	True	
B	False	

Qu 32	TRUE OR FALSE a) Cumulative frequency tables indicate the total frequency up to a particular class boundary. b) Bar charts are most effective when used to display continuous data	
A	True	
B	False	

Qu 33	TRUE OR FALSE a) Scatter diagrams can only identify non-linear correlation. b) A positive correlation occurs when values of both variables fall or rise together.	
A	False	
B	True	

Qu 34	TRUE OR FALSE a) The value of the product moment correlation coefficient cannot be less than zero. b) The value of the Spearman's rank correlation coefficient cannot be less than zero	
A	False	
B	False	
Qu 35	DROP DOWN In a seasonally adjusted set of data, the seasonal component has been removed, allowing the (trend) component to be more visible. Some time series have a high random component and the forecasts of these series will be subject to a high degree of (error).	
A	trend random, cyclical, normal	
B	error use, demand, misuse	

Qu 36	TRUE OR FALSE a) A high correlation coefficient indicates a strong causal relationship. b) A negative correlation coefficient means that there is no association between the two variables.	
A	False	
B	False	

Qu 37	DROP DOWN Two events are said the be (independent) if the occurrence of one does not affect the occurrence of the other. If two events are mutually exclusive, the probability of them both happening together is (zero).	
A	independent exclusive, dependent, inclusive	
B	zero one, variable, unpredictable	

Qu 38	TRUE OR FALSE a) To seasonally adjust a time series, you multiply by the seasonal factor. b) Exponential smoothing is a short-term forecasting technique.	
A	False	
B	True	

Qu 39	TRUE OR FALSE a) As sample size increases, the error in an estimation decreases. b) If the sample size doubles, the half width of the confidence interval reduces by half.	
A	True	
B	False	

Qu 40	DROP DOWN (Significance) testing is used to determine whether any differences are due to ordinary random factors or not. If the difference is probably not due to (chance) factors, the difference is said to be statistically significant.	
A	Significance Data, Statistical, Information	
B	chance general, predictable, environmental	

Qu 41	TRUE OR FALSE a) The chi-square distribution is symmetrical about the mean. b) The chi-square test cannot be applied to a table of percentages.	
A	False	
B	True	

TOTAL AVAILABLE MARKS = 100