



Foundation Certificate in Marketing - Stage 1

MARKETING INFORMATION ANALYSIS I

FRIDAY, MAY 10, 2002. TIME: 2.00 pm - 5.00 pm

Please attempt **FIVE** questions.

(If more than the specified number of questions are attempted, delete those you do not wish to have marked. Otherwise the Examiner will mark the **FIRST** five questions in your Answer Book).

All questions carry equal marks.

Do **NOT** repeat question in answer, but show clearly the number of the question attempted on the appropriate page of the Answer Book.

1. (a) Explain **two** of the following terms by means of business examples:
Sampling Frame
Systematic sampling
Cluster sampling
Stratified random sampling.
- (b) In a random sample of 39,000 adults from a population of 1.287 million households in the state, it was reported that 32% had a home computer in their household. Estimate the upper and lower limits of a 95% confidence interval for the number of households in the State that have a home computer.
2. (a) Costs of accommodation in a particular city were found to be as follows:

<i>Accommodation type</i>	<i>Rental per month in euro</i>	<i>Number rented</i>
1 bed apartment	800	95
2 bed apartment	1050	157
Terrace/townhouse	1200	66
3 bed semi-detached	1350	52
4 bed semi-detached	1700	31
4 bed detached	2500	24

Calculate the mean and the standard deviation.

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- (b) The mean expenditure on food away from home of 4904 urban households was £25.12 per week according to the results of the Household Budget Survey 1999-2000. For the total of 7645 households, both urban and rural included in this survey, the average spending on such food was calculated to be £1,150 per household per annum.

Calculate the mean *weekly* expenditure on food away from home for rural households. (5 marks)

- (c) An A.C. Nielsen Retail Census shows the following results (data are rounded).

<u>Shops</u>	<u>Turnover 1996</u>	<u>Turnover 2002</u>
Top 2%	50%	54%
Next 3%	18%	20%
Next 5%	13%	12%
Next 10%	5%	6%
Next 30%	6%	5%
Lowest 50%	8%	3%

Construct Lorenz curves to illustrate this concentration within the Irish grocery business since 1996. What conclusions do you draw? (5 marks)

3. (a) Use the Consumer Price Index to deflate the actual earnings of industrial employees and thus calculate an index of real wages for both females and males. All wage rates are per week in euro and the Consumer Price Index is calculated with base 1996 = 100.

	Average Male Wage (€)	Average Female Wage (€)	Consumer Price Index
1997	371.06	272.21	100.7
1998	385.23	284.24	103.1
1999	410.09	300.10	104.8
2000	439.58	331.02	110.7
2001	481.73	351.46	116.1

- (b) Use the table above to calculate an index of the *relative* wages of female to male employees. Interpret your findings.

4. Quarterly data shows the decline in sales in a firm.

	Quarter 1	Quarter 2	Quarter 3	Quarter 4
1998	7436	10821	9645	8265
1999	7113	9510	8837	7843
2000	7002	9197	8336	7600
2001	6899	8854	7493	7186
2002	6604	8230		

- (a) Graph the data. (5 marks)
- (b) Calculate the trend. (10 marks)
- (c) Use the data to forecast the sales expected in Q3 and Q4 in 2002. (5 marks)
5. (a) Management trainees are ranked by the HR manager in order of potential from 1st to 8th and their academic qualifications are also ranked.

<i>Trainee</i>	<i>HR Manager's Rankings</i>	<i>Qualifications</i>
A	1	2
B	2	5
C	3	4
D	4	equal 7th
E	5	3
F	6	equal 7th
G	7	1
H	8	6

Interpret the data using appropriate calculations. (6 marks)

- (b) The data below show the miles per gallon achieved by a number of cars and the engine size as measured in ccs.

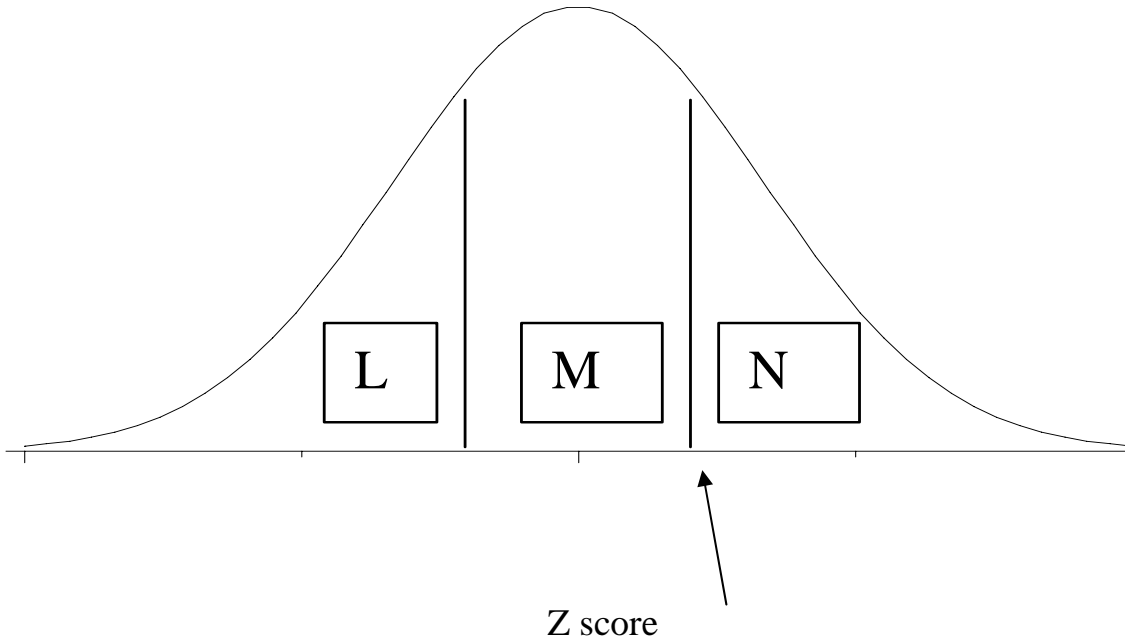
CAR	Engine Size (ccs)	Miles per gallon
A	1397	35
B	1985	27
C	1990	26
D	985	48
E	1198	33
F	1,095	43

Use a least squares regression line to predict the miles per gallon achieved by a car having an engine size of 1597 ccs. (10 marks)

- (c) Given that $Y = a + bX$ is the equation of a regression line, sketch scatter diagrams for each of the following situations where:
- (i) a is negative and b is positive
- (ii) a is positive and b is negative. (4 marks)

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6. (a) Areas L, M and N under this Normal distribution are equal. What is the value of Z to 2 decimal places?



- (b) Out of 600 employees in a particular organisation, 180 out of 240 younger employees were against a particular wage settlement. Overall, 300 employees favoured this settlement. What is the probability that an employee selected at random would be an older worker who opposed the settlement?
- (c) If a local computer network in a firm is found to ‘crash’ following a Poisson distribution with a mean of 1 crash per year, what is the probability that in a particular year there will be more than 2 crashes?
- (c) A euro printing facility has 3 independent security systems to detect attempted break-ins. These systems operate independently of one another and each has a probability of 0.92 of detecting an attempted break-in. If an attempted break-in occurs, what is the probability that none of the systems will identify it?
7. (a) It is claimed that a particular treatment gives relief to 45% of sufferers of a particular ailment. In a test of 300 sufferers who underwent the treatment, 117 reported such relief. Is this result significant at either the 1% or 5% levels of statistical significance?

- (b) Suppose that a small random sample of 10 bookstores in Dublin were visited to identify the price in euro of specific books. A similar selection was undertaken in Paris and the results noted as below.

	Mean Price of books	Standard Deviation
Paris	€10.76	€1.62
Dublin	€12.08	€2.75

Is there statistical evidence that significant differences exist between the two cities?

8. (a) The table attached is from the Joint National Readership Research 2000 produced by Lansdowne Market Research Ltd. Quote the relevant statistics in answering each of the following:
- (i) What is the sample size used to represent the entire province of Leinster?
 - (ii) Calculate the percentage of adults over 55 years old in the state.
 - (iii) Use an example to show the meaning of the "universe est." figures.
 - (iv) What percentage of all ABC1 adults read the RTE Guide?
 - (v) Comment on the claim that the Sunday World has a higher readership than the Sunday Independent among all those who are under 45 years old.
- (b) Draft guidelines that should be followed in preparing a written research report.