



Foundation Certificate in Marketing - Stage 1

MARKETING INFORMATION ANALYSIS I

FRIDAY, AUGUST 22, 2003. 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) Why would a researcher use quota sample in preference to either stratified random sampling or simple random sampling? (5 marks)
 - (b) Explain what is meant by the term *statistical sampling error*. (5 marks)
 - (c) A researcher wishes to estimate household spending on the purchase of a PC, other hardware, Internet access and the associated phone bills. The precision of the population estimate is required to be at 99% confidence and another investigation elsewhere showed the mean was €1,850 with a standard deviation of €300. What sample size is required if the precision of the population mean is required to be within $\pm\text{€}20$? (10 marks)
2. The following data from a simple random sample of records from the estimated 3,000 customers that use a particular car park are as follows:

TIME	COST	Percentage of customers
Up to 15 minutes	Free	10%
15 minutes to under 1 hour	€1.80	13%
1 hour to under 2 hours	€3.60	17%
2 hours to under 3 hours	€5.40	20%
3 hour to under 4 hours	€7.20	18%
4 hour to under 6 hours	€9.00	12%
5 hours to a full day	€12.00	10%

- (a) Calculate the mean and the standard deviation for the above data. (10 marks)
- (b) Calculate a 95 % confidence interval for the mean car parking bill. (5 marks)
- (c) Select **either** a semi log graph **or** an Z- chart, show how it is constructed, sketch it and tell why it might be useful for business analysis. (5 marks)

P.T.O.

3. (a) Population levels over the past half century are shown in the table below.

Derive an index for the population of Dublin, Leinster and the State. Write a brief comment on how the population has changed (no more than two or three sentences are necessary). (5 marks)

	1951	1961	1971	1981	1991	2002
State	2,960,593	2,818,341	2,978,248	3,443,405	3,525,719	3,917,336
Leinster	1,336,576	1,332,149	1,498,140	1,790,521	1,860,949	2,105,449
Dublin	693,022	718,332	852,219	1,003,164	1,025,304	1,122,600

- (b) Describe how the Irish Consumer Price Index is constructed (10 marks)
 (c) Since 1992, social housing has been counted separately in annual CSO Statistics.

New Dwellings Completed			
Year	Social Housing	Private	Total
1992	1,482	20,982	22,464
1993	2,090	19,301	21,391
1994	3,275	23,588	26,863
1995	3,971	26,604	30,575
1996	3,593	30,132	33,725
1997	3,388	35,454	38,842
1998	3,256	39,093	42,349
1999	3,488	43,024	46,512
2000	3,155	46,657	49,812
2001	3,622	47,727	52,602

Source: Department of Environment

Construct indices of Social and Private Housing completions and draw conclusions. (5 marks)

4. Quarterly sales figures (in €thousands) of a company are shown below:

	Q1	Q2	Q3	Q4
1999	868	932	700	768
2000	912	987	731	785
2001	984	1211	754	832
2002	993	1234	855	unavailable

- (a) Use any method of your choice to calculate the trend and the seasonal variation. (10 marks)
 (b) Explain the meaning of the phrase *seasonally adjusted data*. (5 marks)
 (c) Forecast sales for each quarter of 2003 (5 marks)

5. Data below show the time (in minutes) taken by workers with varying levels of technical experience to produce a precision item. Workers are paid entirely on the basis of their output.

Time taken (Minutes)	27	26	30	20	22	20	16	15	30	19
Months of experience	2	5	3	8	5	9	12	16	1	6

- (a) Construct a scatter diagram and interpret it. (5 marks)
- (b) Calculate a regression equation to estimate the time taken for the precision item based on months of experience. (10 marks)
- (c) Use the equation to estimate the pay of a worker with four months' experience as a percentage of that of a worker with fifteen months' experience, if the workers' time on production is 30 actual hours a week. (5 marks)
6. (a) Suppose that the chances of being caught using a mobile phone while driving is 0.1. If a motorist engages in such practices on 10 separate occasions, what are the chances of never being caught? (5 marks)
- (b) Mensa is an internationally known high-IQ society and to be a Mensa member, a person must have an IQ in the top 2%. If IQ test scores are normally distributed with a mean of 100 and a standard deviation of 15, what score must be achieved? (5 marks)
- (c) Suppose a photocopier jams once in a run of 2,000 copies on average and follows a Poisson distribution. What is the likelihood that on any run of 2,000 copies, more than one jam occurs? (5 marks)
- (d) A survey of households showed that 200 owned both a DVD player and a second TV, 300 owned a DVD player but not a second TV, 400 owned a second TV but not a DVD player, while 500 owned neither appliance. What is the probability that any randomly selected household who owned a second TV also had a DVD player? (5 marks)
7. (a) To investigate whether or not airline "no shows" significantly vary by day of the week, the following no show sample data were produced.
- | | | | | | | |
|-----|------|-----|-------|-----|-----|-----|
| Mon | Tues | Wed | Thurs | Fri | Sat | Sun |
| 63 | 57 | 56 | 44 | 30 | 56 | 58 |
- Test at the 5% level of statistical significance. (10 marks)
- (b) To test a claim that the average rural household spends no more than €600 on holidays abroad, a random survey was undertaken on 400 households. It was found that they spent an average of €330 with a standard deviation of €380. Perform a suitable hypothesis test to determine whether or not the claim is disproved by this evidence. (10 marks)

P.T.O.

8. (a) What guidelines should be followed in making a written market research report?
(10 marks)
- (b) The table attached is from the Joint National Readership Research 2001 produced by Lansdowne Market Research Ltd. It is **essential** to quote the relevant statistics in answering each of the following:
- (i) What number of people attended the cinema more frequently than once a month ?
 - (ii) How many under thirty-five year old people were interviewed in this survey?
 - (iii) Among those who attend the cinema at least once a week, is the audience more likely to comprise people working part-time or fulltime?
 - (iv) What number of people never go to the cinema?
 - (v) Do more ABC1 people attend the cinema 2-3 times a year than those classified as C2DE?
(10 marks)