



Foundation Certificate in Marketing - Stage 1

MARKETING INFORMATION ANALYSIS I

FRIDAY, MAY 7, 2004. 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) A research director is examining the cost for a major project to estimate the proportion of adults who currently own mobile phones. It is envisaged that the costs of interviewing and data processing will amount to €5 per person, with fixed costs for the survey amounting to €1,500. If the total budget to be spent is €4,000 and the proportion of mobile owners is estimated to be about 80 percent, what level of precision will attach to the population estimate at 95% confidence? It is presumed that simple random sampling will be adopted. (10 marks)
- (b) Why would a researcher use stratified random sampling rather than simple random sampling? (5 marks)
- (c) Write a detailed description of how a systematic sample of size 300 might be chosen from a college which has 6,000 registered students. (5 marks)
2. (a) A simple random sample of mortgage accounts is selected and the outstanding balance is noted below. (All data is rounded to the nearest €1,000).

19	271	20	50	47	40	15	69	17	29
15	108	90	63	172	110	414	213	83	105
14	49	20	75	53	128	144	26	12	67
95	162	150	15	130	74	98	166	19	57
108	19	83	151	44	135	91	37	29	38
- Present these data in a histogram. (5 marks)
- (b) Calculate the standard deviation for the data. (5 marks)
- P.T.O.**
- (c) The mean expenditure on services of 4904 urban households was €129.46 per week, according to the latest Household Budget Survey. For the total of

7644 households, both urban and rural included in this survey, the average expenditure was calculated to be €16.93 per household per week. What is the mean expenditure per week on services for rural households? (5 marks)

- (d) Show how a Lorenz curve is constructed, sketch it and tell why it might be useful for business analysis. (5 marks)

3. (a) An overall price index is calculated from the data below:

Group	Base (1997)	Weight	Index (2004)
Food & Drink	100	25	140
Housing	100	30	130
Transport	100	10	115
Services	100	35	120
ALL Items	100	100	?

What is the value of the all items index in 2004? (10 marks)

(b)

Year	Average earnings €per week	Consumer Price Index Base 1963 =100
1965	14	104
1970	33	112
1975	52	124
1980	66	151
1985	75	177
1990	117	241
1995	219	277
2000	225	299

Use the Consumer Price Index to deflate the earnings of employees and thus calculate an index of 'real wages' from 1965. Interpret your results.

(10 marks)

4. International travel by Irish residents was examined by the CSO in 2003. Patterns found are as follows (in thousands):

	Q1	Q2	Q3	Q4
2000	716	1,028	1,213	811
2001	764	1,115	1,380	903
2002	884	1,177	1,539	997
2003	954			

- (a) Plot the data on a graph. (5 marks)
 (b) Calculate the trend and the seasonal variation. (10 marks)
 (c) Forecast travel patterns for each quarter of 2004 (5 marks)

5. (a) What is the correlation coefficient (i.e Pearson's product moment correlation coefficient)? Why do statisticians calculate it? (5 marks)

- (b) If a student calculated the value of this correlation coefficient to be -1.24 , what conclusion should s/he draw? (5 marks)
- (c) A Sales Manager ranked staff from 1 = 'Best' to 10 = 'Worst' in terms of selling potential at the end of a training course. A year later the number of units sold by each person was recorded.

Salesperson	A	B	C	D	E	F	G	H	I	J
Rank	7	4	2	6	1	10	3	5	9	8
Sales (units)	770	660	820	580	720	440	660	810	560	470

What is the correlation (if any) between the manager's assessment and the first year's sales? (10 marks)

6. (a) A committee of three officers is to be chosen from a group of 7 elected members. What is the total number of different committees that can be selected, if no account is paid to who is appointed as President, Secretary and Treasurer? (5 marks)
- (b) In a particular week a firm received 50 deliveries, of which 5 were incomplete. If any two of the deliveries are randomly inspected, what is the probability that neither of them will be incomplete? (5 marks)
- (c) Suppose that mobile phone bills are Normal distributed with a mean of €90 per month and a standard deviation of €35. If the top 10% of users are to be given a special heavy user rate, what is the minimum level of monthly bill that would be included in this segment? (5 marks)
- (d) If the probability is 0.003 that a computer component is below technical specifications, what is the probability that in a sample of 2000 components any components are found to be sub-standard? (5 marks)

P.T.O.

7. (a) To investigate whether car faults varied significantly by the day of the week on which they were manufactured, the following sample data showing the number of faulty cars was gathered:

Monday	Tuesday	Wednesday	Thursday	Friday
159	149	137	144	176

Test whether or not these data are statistically significant at the 1% level.
(10 marks)

- (b) A pharmaceutical company claimed that 65% of their customers gained relief from symptoms for 12 hours by using a particular product. As this claim was doubted, a consumer association took a random sample of 200 customers and found that only 118 customers found such relief. Is the claim disproved by this evidence? Test at the 5% level of significance. (10 marks)

8. (a) Draft guidelines to be followed in making a written market research report. (10 marks)

- (b) The table attached is from the Joint National Readership Research 2001-2 produced by Lansdowne Market Research Ltd. It is **essential** to quote the relevant statistics in answering each of the following:

- (i) What is the estimated population of adults aged 65 and over in the country?
 - (ii) How many under thirty-five year old people were interviewed in this survey?
 - (iii) Do internet providers to Irish homes have more customers from AB social class than from the C1 social class?
 - (iv) According to the data, how many people over the age of 15 don't have a mobile/cellular phone?
 - (v) What percentage of ABC1 people has a home alarm system?
- (10 marks)

Please see the following separate documents for the above question
104 Table 1 and
104 Table 2