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 bank customers who have changed their current accounts. The costs of interviewing and data processing will amount to €6 per person, with fixed costs for the survey amounting to €1,800. If the total budget to be spent is €15,000 and the proportion of customers changing accounts is estimated to be about 12 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)　What is the meaning of the terms "probability" and "non-probability" sampling and what are the advantages and disadvantages of each approach?
　　　　　　　　　　　　　　　　　　　　　　　　　　　(5 marks)

　　(c)　Set out a table showing the allocation by gender and age (15-24, 25-44 and 45 & over) for a representative sample of 1200 people, given the population structure shown in the table below.

POPULATION BY AGE

2004 Population Age Group	Persons (000)	Gender Males(000)	Females(000)
0-14	843.2	432.5	410.7
15-19	300.8	154.1	146.7
20-24	338.7	170.3	168.5
25-44	1,233.8	616.6	617.1
45-54	495.8	248.4	247.4
55-64	381.6	192.3	188.3
65 years and over	450.8	197.1	253.7
Total	**4,044.7**	**2,011.3**	**2,032.4**

Source: CSO　　　　　　　　　　　　　　　　　　　　(5 marks)

P.T.O.

2.　A sample of customers of a hotel group had the following age profile.

31	74	52	36	46	76	36	43	83	45
50	67	42	55	70	95	48	57	49	81
27	43	71	35	56	58	45	47	48	57
67	36	67	49	43	45	34	55	63	22
19	43	24	74	53	32	23	32	70	81
73	64	32	55	66	70	31	22	74	34
52	31	78	41	44	56	28	55	55	42
46	25	59	83	34	36	31	35	59	76
34	27	64	64	28	60	35	69	21	60

(a) Show the age distribution in a histogram. (5 marks)

(b) Calculate the mean for the sample. (5 marks)

(c) Calculate the standard deviation for the sample. (5 marks)

(d) What does the standard deviation measure and how can it be used to full advantage? (5 marks)

3. (a) Overseas trips by Irish people were reported by the CSO as follows:

	2001	**2002**	**2003**	**2004**
Jan	227,300	258,200	293,700	332,900
Feb	262,200	286,900	302,000	346,500
Mar	270,200	347,900	346,300	361,900
Apr	321,600	322,000	355,000	409,000
May	372,700	406,900	433,100	473,600
Jun	446,600	482,100	527,500	550,800
Jul	481,200	523,900	547,300	618,800
Aug	491,600	553,700	566,600	594,700
Sep	466,700	479,800	483,100	538,400
Oct	365,000	395,700	432,000	507,600
Nov	275,900	284,600	321,000	335,400
Dec	248,800	303,300	322,500	348,200

Using the data, calculate an index of ANNUAL travel overseas using the year 2001 = 100. Interpret your results. (5 marks)

(b) Describe how the Consumer Price Index is calculated by the Central Statistics Office in Ireland, indicating the problems involved. (10 marks)

(c) Briefly describe two industrial or business uses of index numbers. (5 marks)

4. (a) Use the data of question 3 above to draw a graph of quarterly data for
         overseas trips from 2001 to 2004.   (5 marks)
    (b) Calculate the trend and the seasonal variation.   (10 marks)
    (c) Forecast travel patterns for each quarter of 2005   (5 marks)

5. A manager, investigating the link between marketing budgets and the value of
    insurance policies sold, gathered the following data.

BRANCH	Marketing budget (€000)	Value of policies sold (€million)
A	450	26
B	300	18
C	330	20
D	650	29
E	750	30
F	800	45
G	240	12
H	500	20

    (a) Draw a scatter diagram and interpret your findings.   (5 marks)

    (b) What is the value of the correlation coefficient?   (5 marks)

    (c) Use a regression equation to forecast the value of policies sold if the
         marketing budget was set at €550, 000.   (10 marks)

6. (a) A survey shows that 100 adults owned both a digital camera and a laptop,
         150 owned a digital camera but not a laptop, 200 owned a laptop but not a
         digital camera, while 300 owned neither. What is the probability that any
         randomly selected individual who owned a laptop also owned a digital
         camera?   (5 marks)

    (b) A company with a large number of debtors claims that the mean amount they
         owe is €5,300. If the standard deviation of the amount owed by all debtors is
         €1,000, what percentage of debtors owes more than €4,000?
                                                                             (5 marks)

    (c) Based on past experience, printers in a university computer laboratory are
         available 90% of the time. If a random sample of 5 time periods is selected,
         what is the probability that printers are available fewer than 5 times?
                                                                             (5 marks)

    (d) Customer purchases are made through an on-line company following a
         Poisson distribution with an average of 2 calls per minute. What is the
         probability that in any particular minute more than 2 calls will arrive?
                                                                             (5marks)
                                                                             P.T.O.

7. (a) Suppose the following data were obtained in a randomly chosen sample.

   Purchased an IPod within past 6 months

Purchased	Under 12 years old	12 - under 15	15-19 years old
Yes	50	50	100
No	40	60	70

   Conduct a Chi-square test to determine whether or not these figures indicate a statistically significant difference in purchasing across the various age groups. (10 marks)

   (b) In a survey in rural areas it was found that 76 out of 350 shoppers bought a new product. In urban areas a sample survey of 400 shoppers showed that 100 bought the product. Is this a statistically significant difference? Test at the both the 1% and 5% levels (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 Internet Research 2003 produced by Monitrack. It is **essential** to quote the relevant statistics in answering each of the following:

   (i) What is the estimated population of adults aged over 50 years of age in the country?
   (ii) How many people aged thirty-five years old and younger were interviewed in this survey?
   (iii) Do internet providers to Irish homes have more customers from ABC1 social class than from the C2DE social class?
   (iv) According to the data, how many people over the age of 15 didn't use the internet?
   (v) How many people logged onto eircom.net outside of Dublin?

   (10 marks)

   Please use tables attached for the above question.