Random Samples

2 A random sample of 5 people is to be drawn from 10 people whose surnames are Ali, Budd, Cook, Dost, Evans, Fox, Grant, Hall, Ip, Jenks. Use the following extract from a table of random numbers, starting at the beginning, to obtain the sample, and write down the names of the people chosen. Make your method clear.

Jun 04

079 831 130 709 938 423 756 281 787 118 [4]

2 The editor of a local newspaper is attempting to determine what proportion of the adults in the area served by the newspaper is interested in environmental matters. One issue of the newspaper therefore contains a questionnaire which readers are invited to complete and return.

Jan 05

(i) Give two reasons why the results obtained may be biased. [2]

(ii) Describe briefly an unbiased method of obtaining the information. [3]

3 A statistician is collecting data about the sporting interests of the adults in a particular town. She stands at a street corner in that town on a Saturday morning and asks twenty passers-by to complete a questionnaire.

Jun 02

(i) Explain why this method will not produce reliable results. [2]

(ii) Describe a method that will produce more reliable results. [3]

3 A year group in a school contains 200 pupils. A random sample of 8 pupils is to be selected from the year group.

Jun 04

(i) Describe how 3-figure random numbers (obtained from either tables or a calculator) could be used to select the sample. [2]

(ii) 120 of the 200 pupils have surnames beginning with letters in the first half of the alphabet (from A to M). Use a binomial distribution to estimate the probability that at least 6 of the 8 selected in the random sample have surnames beginning with letters in the first half of the alphabet. [3]

1 (i) Explain briefly how you would use random numbers to obtain a random sample of size 20 from those eligible to vote in a parliamentary constituency. [2]

Jan 03

(ii) In the constituency it is known that 30% of those eligible to vote are in social classes A or B.

(a) Find the probability that a random sample of size 20 contains at least 9 people in social classes A or B. [2]

Suppose that in your random sample there are 9 people in social classes A or B.

(b) What answer would you give to a commentator who claimed that your sampling method was biased? (You are not expected to carry out a significance test.) [1]

Random Samples (cont 1)

Jun 3 02

A certain neighbourhood contains many small houses (with small gardens) and a few large houses (with large gardens). A sample survey of all houses is to be carried out in this neighbourhood. A student suggests that the sample could be selected by sticking a pin into a map of the neighbourhood the requisite number of times, while blindfolded.

(i) Give two reasons why this method does not produce a random sample. [2]

(ii) Describe a better method. [3]

Jun 01 2 (ii) Describe briefly how, in practice, the random sample of 60 pupils might have been obtained. [2]