

Uva Wellassa University

First Year First Semester Examination- 2011 March/April

ESS 104-3 Quantitative Reasoning

Time: Three (03) hours



Part B: Essay Questions

Answer All Questions

Time: One (1) hour and Thirty (30) minutes

Total Marks = 50

The number of marks allotted to each question is shown in brackets

1.
 - I. Present arguments in favor of conducting interviews over the telephone instead of face to face.
 - II. The marketing director of a chain of supermarkets would like to set up an interview survey of a sample of customers. The supermarkets are located in several different regions, and are classified into three types according to size. A sample of supermarkets is to be taken, and samples of customers will be drawn from these supermarkets.
 - a) Suggest how cluster sampling could be used to choose the sample of supermarkets. Discuss any potential advantages and disadvantages of this method for the proposed survey.
 - b) Suggest how stratified sampling could be used to choose the sample of supermarkets. Discuss any potential advantages and disadvantages of this method for the proposed survey.
2. A random sample of 50 households is taken in each of two districts, A and B, and for each household the presence or absence of digital television is recorded. The data are presented in the table below.

(15 Marks)

	District A	District B
Digital TV: Yes	38	27
Digital TV: No	12	23

Investigate whether there is significant evidence of a difference between the two districts in the uptake of digital TV. Briefly state your conclusions. (Chi square table value = 3.841)

(08 Marks)

3. The information below is derived from the National Diet and Nutrition Survey of British Adults, 2008–2009. It relates to a random sample of adults aged 19–64 in private households in mainland Britain.

Age (years)	Number of Men	Number of Women
19–24	61	78
25–34	160	211
35–54	393	486
55–64	152	183
Total	766	958
Region		
Scotland and the North	248	326
Central, South West and Wales	274	350
London and the South East	244	282
Current smoker		
	236	313

Write a report comparing the representation of men and women within the various categories in this achieved sample. Your report should include diagrams and summary statistics. You should hand in any calculations needed to produce the diagrams and summary statistics, making clear that these calculations are not part of the report.

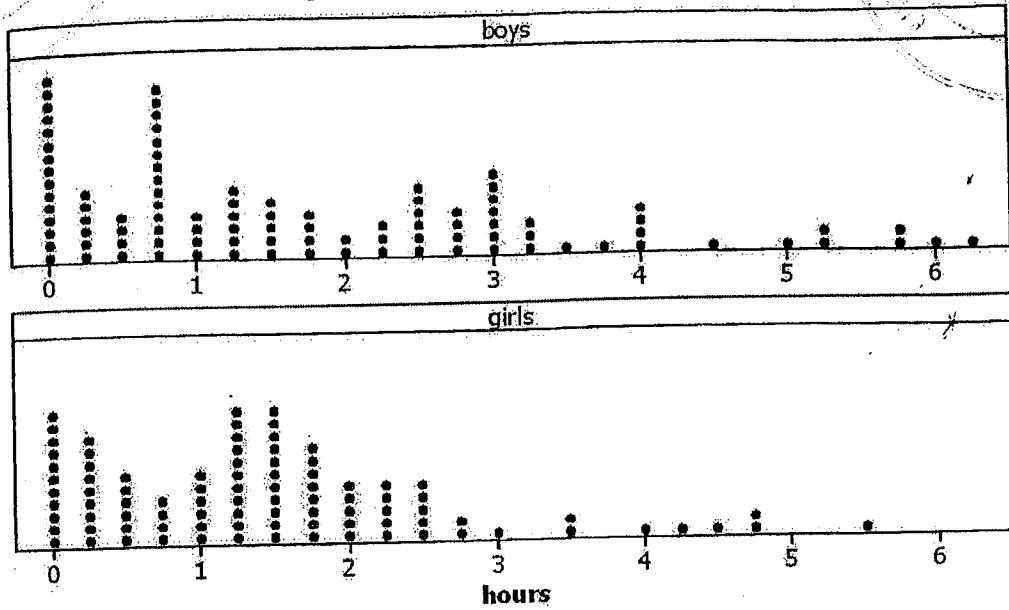
(15 Marks)

4. A health-related survey of school children has been undertaken. One of the questions was "How long did you spend watching television after school yesterday? Give your answer to the nearest quarter of an hour". Some computer output relating to the responses that were given to this question by a random sample of boys and girls aged 15–16 is given below.

No. of hours	N	Mean	SE Mean	Standard Deviation	Minimum	Q1	Median	Q3	Maximum
Boys	97	1.799	0.164	1.613	0.000	0.500	1.250	2.875	6.250
Girls	92	1.473	0.126	1.205	0.000	0.500	1.250	2.000	5.500



Dot-plot of number of hours watched



- I. The arithmetic mean, the median and the mode are three common measures of location of a distribution. Write sentences to explain what they are to someone who is not familiar with these terms. You should incorporate values from the output into your explanations.
- II. What advantages do you think dot-plots have over histograms in this example?

(12 Marks)

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Maximum

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