

**SUPPLEMENTARY EXAMINATION PAPER 2005**

**TITLE OF PAPER : DESCRIPTIVE STATISTICS**

**COURSE CODE : ST 132**

**TIME ALLOWED : TWO (2) HOURS**

**REQUIREMENTS : CALCULATOR AND GRAPH PAPER**

**INSTRUCTIONS : ANSWER QUESTION ONE AND ANY OTHER  
TWO QUESTIONS**

**Question 1**

A mail order company is considering whether or not to open a call centre so that it could take more orders by telephone and so reduce the costs of processing orders. In order to evaluate the length of time spent on the telephone when an order is placed, it has conducted a small pilot survey with a number of its long-established customers and asked them to use the telephone rather than the post when ordering. The durations of 40 such telephone calls are shown in the table.

**Duration (seconds) of customer telephone order calls**

422	317	503	325	76	217	411	69	255	299
172	274	325	552	522	526	72	86	325	286
299	255	459	586	581	556	555	103	215	139
444	114	501	489	85	286	270	497	333	299

- a) Calculate the inter-quartile range of these scores. (20 Marks)
- b) Using coefficient of skewness determine whether the distribution of the scores is symmetrically shaped? (20 Marks)

**Question 2**

- a) Explain what is wrong with the conclusions in **bold type** in each of the following statements.
- (i) In Town M, the correlation coefficient between the ages of men and women at marriage is 0.94. **Hence a man is likely to marry a woman of his own age.**
- (ii) An index number of retail prices in April 1995 was 124.2 (Jan 1994 = 100). In April 2000, the value of the index was 150.4 (Jan 1994 = 100). **Hence prices had gone up by 26.2% between April 1995 and April 2000.**
- (iii) Company N is a company employing 500 people, a few of whom are highly paid specialists. The mean annual salary of employees in the company is £15,355. **Hence half the employees earn less than £15,355 per year.**
- b) An insurance company classifies drivers according to sex and to whether they are under 25 or 25 years and over. It finds that 60% of its drivers are male; 25% of the male drivers and 30% of the female drivers are under 25. Find the probabilities that a randomly chosen driver is in each of the four categories
- (i) male and under 25,  
 (ii) male and 25 or over,  
 (iii) female and under 25,  
 (iv) female and 25 or over,  
 (v) under 25,  
 (vi) male given that the driver is under 25,  
 (vii) male or under 25 (or both),  
 (viii) neither male nor under 25.

(11 Marks)

**Question 3**

The table below gives the length,  $L$ , in metres and the wing-span,  $S$ , in metres of ten aeroplanes.

**Values of length ( $L$ ) and wing-span ( $S$ ) for ten aeroplanes**

$L$	70.8	70.7	47.3	54.9	36.6	30.5	63.7	37.6	62.1	55.3
$S$	59.6	64.9	37.9	47.6	28.9	28.0	60.9	33.9	25.5	50.4

- a) Determine the strength of the relationship between Length and Wing-span. (8 Marks)
- b) Derive a regression equation for predicting the dependant variable and its standard error. (12 Marks)

**Question 4**

The table provides data about the use of electricity in a large college for each quarter from 1996 Qtr 1 to 2000 Qtr 2.

<i>Year/Quarter</i>	<i>Units used (000s)</i>
1996/1	207
/2	152
/3	127
/4	176
1997/1	172
/2	186
/3	133
/4	177
1998/1	204
/2	175
/3	131
/4	174
1999/1	183
/2	176
/3	132
/4	175
2000/1	194
/2	164

Using the method of moving averages, find the average seasonal variations, and estimate the units used for the last two quarters of 2000. (20 Marks)