STAMFORD COLLEGE

FOUNDATION STUDIES IN BUSINESS

(SEMESTER 2)

FSBN 111 : BUSINESS STATISTICS

Date : 24 May 2007 (Thursday)
Time : 9.30 am – 11.30 am **Duration : 2 hours**

Instructions to Candidates

This paper consists of two sections. Candidates are required to ALL questions from Section A and ANY TWO questions from Section B.

Please ensure that this examination paper contains FOUR questions on THREE printed pages before you start the examination.

Books, papers and other written materials are not allowed to be brought into the examination hall. A candidate who violates the examination rules of Stamford College or commits a malpractice will be disqualified from the examination.

Write your Examination Index Number on each page of your answer booklet.

Graph papers are provided.

Formulae sheet is provided on page APPENDIX 1

SECTION A (COMPULSORY)

Answer ALL parts of the question from this section.

Question 1

(a) Explain and differentiate between quantitative data and qualitative data and give ONE example for each of them. (8 marks)

(b) A large furniture removal company charts the availability of its vans on a daily basis. The following data give the number of vans not available for all or part of a day, each working day, over a sixty day period.

1	1	4	2	0	1	0	0	2	1	1	1	0	0	2	3	5	2	2	1
3	6	3	1	0	1	1	1	0	2	2	1	3	2	1	0	1	3	5	5
7	3	1	1	3	2	2	0	1	3	1	1	0	0	0	1	3	2	4	1

Compile a simple frequency distribution, paying attention to labelling. (8 marks)

(c) Draw a line diagram to display the following data, which relates to reported accidents in a certain industry.

Year	1	2	3	4	5	6	7	8	9	10	11
Number of accidents	23	17	25	31	15	19	26	11	9	16	10

(8 marks)

(d) The following data give the number of hours spent partying by 10 randomly selected college students during past week.

7 14 5 0 2 7 10 4 0 8

Compute the:

(i) Mean (3 marks)
(ii) Median (3 marks)
(iii) Standard deviation (4 marks)
(iv) Coefficient of range (2 marks)

(e) The following data give the height of 100 students.

Height (cm's)	Number of Students
150	8
151	13
152	12
153	7
154	30
155	19
156	11

Find the:

(v) Mean (4 marks)
(vi) Median (4 marks)
(vii) First and the third quartiles (4 marks)
(viii) Mode (2 marks)

(f) Construct a scatter diagram each to show:
(i) Perfect positive correlation (2 marks)
(ii) Strong negative correlation (2 marks)

(g) The quarter sales ($ '000) of a product by a company are given below:

Year	Q1	Q2	Q3	Q4
2005	40	130	60	170
2006	80	210	100	250

Calculate the 4 quarter moving average for the above data. (6 marks)

(Total = 60 marks)

SECTION B
Answer ANY TWO out of THREE questions from this section.

Question 2

The ages of company's employees are tabulated below:

Age in years	20 – 25	25 – 30	30 – 35	35 – 40	40 – 45	45 – 50
Number of employee	2	14	29	43	33	9

Table 2

(a) Calculate the following for the above:
(i) Mean (2 marks)
(ii) Standard deviation (4 marks)

(b) Construct the 'less than' ogive for the distribution in Table 2 and estimate the median ages of company's employees. How many of the company's employees are in the following age group:
(i) Less than 37?
(ii) At least 33 but less than 41?
(iii) 39 or more? (14 marks)

(Total = 20 marks)

Question 3

An auto manufacturing company wanted to investigate how the price of one of its car models depreciates with age. The research department at the company took a sample of eight cars of this model and collected the following information on the ages (in years) and prices (in hundreds of dollars) of these cars.

Age, x	8	3	6	9	2	5	6	3
Price, y	16	74	40	19	124	36	33	89

(a) Obtain a scatter plot of the data. (4 marks)
(b) Calculate the product-moment correlation coefficient and interpret its value. (8 marks)
(c) Fit a regression equation to the data in part (a) (8 marks)

(Total = 20 marks)

Question 4

The following data shows the sale of a product in the period 2003 – 2005.

	Quarterly Sales ($ '000)			
Year	**Q1**	**Q2**	**Q3**	**Q4**
2003	86	42	57	112
2004	81	39	55	107
2005	77	35	52	99

(a) Plot the time series on a diagram. (7 marks)
(b) Using the moving average method, find the trend within the data. (8 marks)
(c) Draw the trend line in the diagram above and comment on it. (5 marks)
(Total = 20 marks)

– END OF PAPER –

LIST OF FORMULAE (APPENDIX 1)

1. Arithmetic Mean, $\bar{x} = \frac{\Sigma x}{n}$ or $\frac{\Sigma fx}{\Sigma f}$

2. Q_1 Position = $\frac{1}{4}(N + 1)$th position

   Q_2 Position = $\frac{1}{2}(N + 1)$th position

3. Q_3 Position = $\frac{3}{4}(N + 1)$th position

4. Sample Standard Deviation = $\sqrt{\frac{\Sigma (x-\bar{x})^2}{n}}$ or $\sqrt{\frac{\Sigma x^2}{n} - (\bar{x})^2}$

5. Interquartile Range = q3 – q1 where q3 = third quartile; q1=first quartile

6. Quartile Deviation = $\frac{q3-q1}{2}$

7. Variance = (standard deviation)^2

8. Coefficient of range = $\frac{L - S}{L + S}$

   Where L = Largest value and S = Smallest value.

9. Pearsonian Coefficient of Skewness = $\frac{\text{Mean - Mode}}{\text{Standard Deviation}}$ OR $\frac{3(\text{Mean - Median})}{\text{Standard Deviation}}$

10. Quartile Coefficient of Skewness = $\frac{q1 + q3 - 2q2}{q3 - q1}$

11. Pearsonian Correlation Coefficient, r = $\frac{n\Sigma xy - \Sigma x\Sigma y}{\sqrt{[n\Sigma x^2-(\Sigma x)^2][n\Sigma y^2-(\Sigma y)^2]}}$

12. Regression Equation, y = a + bx where

    b = $\frac{n\Sigma xy - \Sigma x\Sigma y}{n\Sigma x^2 - (\Sigma x)^2}$ a = $\frac{\Sigma y - b\Sigma x}{n}$