KENYA METHODIST UNIVERSITY
END OF SECOND TRIMESTER 2006/2007 EXAMINATIONS

FACULTY : SCIENCES
DEPARTMENT : MATHEMATICS AND COMPUTER SCIENCE
COURSE CODE : MATH 133
COURSE TITLE : DESCRIPTIVE STATISTICS
TIME : 3 HRS

Instructions:
- Answer question 1 (compulsory) and any other 2 questions.

Question 1

a) Briefly explain two methods of carrying out surveys in collecting data, giving at least two merits and two demerits of each method. (6 mks)

b) The following frequency distribution shows the resting systolic blood pressure of 35 patients. Blood

Pressure (mmHg)	115-124	125-134	135-144	145-154	155-164	165-174	175-184
Number of patients	4	5	5	7	5	4	5

Calculate the following:
i) Mean
ii) Median
iii) Variance (9 mks)

c) The number of cases of tetanus reported in Kenya during a single month in 2004 has a Poisson distribution with parameter 4.5. Calculate the probability that:
i) Atmost two cases of tetanus will be reported in two months.
ii) At least three cases of tetanus will be reported in a month. (6 mks)

d) The following data gives the quantities and costs of materials for the four divisions of a company for two years.

	Quantity (tones)		***Cost (£)***	
Division	***Year 1***	***Year 2***	***Year 1***	***Year 2***
A	175	201	1540	1830
B	32	46	1270	1490
C	48	43	2760	2490
D	65	66	2160	2070

Calculate Paasche's index number for year 2. Interpret your answer. (5 mks)

e) Give four differences between regression analysis and correlation analysis. (4 mks)

Question 2

a) For the purpose of calculating the dosage for a certain disease, a doctor uses the normal distribution for adult patients with mean of 150 and standard deviation of 20 pounds. Calculate the:
i) Percentage of patients that weigh less than 135 pounds.
ii) Proportion of patients that weigh between 148 and 160 pounds.
iii) Weights between which the middle 95% of the adult patients fall. (7 mks)

b) Briefly discuss the components of a time series. (4 mks)

c) The following data represents the sales of a company for a period for 3 years for a 4-quarter period.

	Quarter			
Year	***I***	***II***	***III***	***IV***
2001	46	86	120	61
2002	53	89	125	61
2003	51	91	132	66

i) Find the 3-quarter moving to determine the trend.
ii) Draw both the original data and 3-quarter moving averages on the same set of axes.

Question 3

a) The data below gives the values for 12 births of the birth weight (x) and the increase in weight between 70 and 100 of life, expressed as a percentage of the birth weight (y).

X (oz)	112	111	107	119	92	80	81	84	118	106	103	94
Y(%)	63	66	72	52	75	118	120	114	42	72	90	91

You may use the following totals:

$\sum x = 1207 \quad \sum y = 975 \quad \sum xy = 94322 \quad \sum x^2 = 123561 \quad \sum y^2 = 86487$

i) Plot the scatter diagram
ii) Calculate the sample correlation coefficient between x and y.
iii) Fit the least squares regression line to the data. (12 mks)

b) i) Briefly discuss the normal distribution. (4 mks)
ii) Give four advantages of using graphical method in representing data. (4 mks)

Question 4

a) Below is a frequency distribution of speed for automobile in a certain town.

Miles per hour	45-49	50-54	55-59	60-64	65-69	70-74	75-79
Frequency	10	40	150	175	75	15	10

Illustrate the date using the following:
i) Histogram
ii) Ogive
iii) Using the diagrams above, estimate the mode, median and number vechies with speed between 56 and 72 miles per hour. (11 mks)

b) State the properties of the binomial distribution together with its mathematical formula. (5 mks)
c) State four limitations of statistics. (4 mks)