THE OPEN UNIVERSITY OF SRI LANKA
BACHELOR OF MANAGEMENT STUDIES PROGRAMME
LEVEL 03
FINAL EXAMINATION 2008
QUANITATIVE TECHNIQUES FOR MANAGEMENT – MCU 1207
DURATION THREE (03) HOURS

DATE : 24.02.2008 **TIME : 9.30 a.m – 12.30 p.m**

Instructions:

Answer any five (05) questions.
All questions carry equal marks.
Use of Non-Programmable Calculator is allowed.

1) (i) Simplify the following expression

$$\frac{(x+y)(2x^2-2xy+5x-5y)}{(x^2-y^2)}$$

(ii) Solve the following equation

$x^2+6x-112=0$

(iii) a) Find the value of the following expression when $x=4$ and $y=1$

$$\frac{(x^2-2y)(x^2+2x-4)}{x^2-(y^2+1)}$$

If $x=y$ then what value of x would make the value of the above (iii) a) expression zero.

(iv) Solve the simultaneous equations

$x^2-y^2=5$

$x^2+y^2=13$

(v) If the product of two positive consecutive even numbers is 288, find the two numbers.

2) a) Simplify the following expression

$$\frac{b^{5/2}\,a^{3/2}(a^2-b^2)^{3/2}\sqrt{(a-b)}}{(ab)^{3/2}(a+b)\sqrt{(a+b)}}$$

b) In an arithmetic progression (AP) The fourth term is 11 and the 6^{th} term is 17. Find the sum of the first eight terms.

c) In a geometric progression the first term is twice the common ratio and the third term is 128 find the sum of the first five terms.

3) (i) Briefly explain how differential calculus is helpful in management decision making.

(ii) Find the differential coefficient of the following functions.

a) $3x^2+4x+7$ b) $(x^3+4)(1-2x)$

(iii) If $y=2x^3-3x^2+7x+4$ find $\frac{d^2y}{dx^2}$

(iv) The total sales of ball point pens would depend on the price as explained by the following expression where "T" represents total sales and "P" is the price.

$$T = 100{,}000 + 72p - 3p^2$$

Find at what price a pen should be sold so as to maximize total sales. At this price what is the total revenue?

(v) Evaluate the following integral

$$\int 4x^3 + 6x^2 + 2x + 5_{dx}$$

4) The following data describe the age of 40 participant at a sports festival

37	21	47	53	73	26	37	42
16	45	48	54	32	24	61	12
52	29	63	51	24	76	46	72
39	69	51	36	57	40	67	41
17	43	32	42	38	47	42	47

a) Prepare a group frequency distribution table by grouping the data into
b) seven classes such as 11-20, 21-30, 31-40, 41-50, 51-60, 61-70 and 71-80.
c) Calculate the mean and standard deviation of age for the groped frequency distribution.
d) Estimate the model age for the distribution.
e) Calculate the cumulative frequency and relative frequency of each class and construct an Ogive.
f) Using the Ogive, estimate the median age and the quartiles.
g) Which average is the best to represent the age of the participants? Give your reasons.
h) How many participants will fall into the age group of mean –standard deviation to mean + standard deviation?
i) Comment on the skewness of data.

5) a) The following data describes the daily sales of two groceries over a period of seven days.

	Sales (Rs.)						
Grocery A	17,000	14,000	19,000	14,000	14,000	18,000	15,000
Grocery B	16,000	18,000	20,000	12,000	22,000	10,000	15,000

(i) Calculate mean, median, mode, standard deviation and coefficient of variation of the daily sales of two groceries separately.
(ii) Comment on the sales of the two groceries using the results of (i) above.

b) A data set with 15 observations was found to have a mean of 47.0 and a standard deviation of 5.3. Subsequently it was realized that while the mean has been correctly evaluated the standard deviation was incorrect. The error in the standard deviation was due to an observation 34 which has been incorrectly accounted as 43. Calculate the correct standard deviation.

6) Write short notes on
a) Primary data and Secondary data
b) Sampling Techniques
c) Bar charts and Pie-charts
d) Measures of central tendency and measures of dispersion
e) Applications of index numbers in business.