THE OPEN UNIVERSITY OF SRI LANKA
BACHELOR OF MANAGEMENT STUDIES DEGREE PROGRAMME
LEVEL 03
FINAL EXAMINATION 2009
QUANTITATIVE TECHNIQUES FOR MANAGEMENT – MCU 1207
DURATION THREE (03) HOURS

DATE: 08.02.2009	**TIME: 9.30 am-12.30 pm**

Instructions
Answer any five (5) questions. All questions carry equal marks.
Use of Non-programmable calculators is allowed.

Q1. (i) Simplify the following expression.

$$\frac{(5x-4y)(3x+2y)(10x+8y)}{(6x+4y)(25x^2-16y^2)}+\frac{2(1-x^2)}{(2x+2)(x-1)}$$

(ii) Solve the following equation.
$$2x^2-7x+6=0$$

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

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

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

(iv) A train travels a distance of 300km at a uniform speed. If the speed has been 5km per hour more, the journey would have taken two hours less. Find the speed of the train.

(v) If $a^c=b$, $b^a=c$, $c^b=a$ the prove that $abc=1$

Q2. (i) Simplify the following expression.

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

(ii) In an arithmetic progression (AP) the third term is 11 and the 6th term is 23. Find the sum of the first five terms.

(iii) 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.

(iv) What is the annual interest rate of a bank if it pays Rs.2500/= for a deposit of Rs2000 after 4 years? (Interest compounded annually).

(v) If $Log_x(5x-2)-Log_x3=2$, Find x

Q3. a) Find the differential coefficient of the following functions with respect to "x"

(i) x^2+7x+4 (ii) $(x^2+3)(x^3+2)$ (iii) $\dfrac{x+3}{x-1}$

b) Find the integral of the following functions with respect to x.

(i) x^2+5x+4 (ii) $\dfrac{x+2}{\sqrt{x^2+4x+3}}$

1

c)   Evaluate the following definite integral.

$$\int \frac{x^3}{\left(2+x^4\right)^5} \, dx$$

Q4.   The following data describes the number of days of leave taken by 40 employees during the year 2008.

8	17	10	4	21	18	15	7	12	16
6	15	8	22	16	12	8	10	7	23
19	4	6	27	17	10	5	13	14	12
20	8	10	20	4	12	2	17	15	7

(i)   Construct a group frequency distribution table considering class intervals as 1-6, 7-12, 13-18, 19-24, and 25-30.

(ii)   Construct a histogramme for the data.

(iii)   With the help of the histogramme find the mode of the data using graphical method.

(iv)   Draw the cumulative frequency curve (ogive)

(v)   With the help of the cumulative frequency curve find the median.

(vi)   Calculate the quartile deviation using data from the ogive.

(vii)   Using the above information express your opinion on employee leave.

Q5.   a)   The following are the marks obtained by 12 candidates at an examination.

64	73	90	35	20	16
24	20	28	40	35	35

Calculate   (i)   Mean
            (ii)   Median
            (iii) Mode
            (iv)   Standard Deviation
            (v)   Coefficient of Variance

b) A collection of 15 observations was found to have a mean of 35 and standard deviation 4. Subsequently it was revealed that while the mean has been correctly calculated the standard deviation is in error. The error has resulted from an observation which is 29 has been by mistaken taken as 39. Calculate the correct standard deviation.

Q6.   Explain the following four methods of collecting data highlighting their advantages and disadvantages.
            (a)   Secondary data
            (b)   Postal Questionnaire
            (c)   Interview Method
            (d)   Direct Observation