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**2007
MCU 1207
ASSIGNMENT TEST**

LEVEL 03

BMS



THE OPEN UNIVERSITY OF SRI LANKA

BACHELOR OF MANAGEMENT STUDIES

DEGREE PROGRAMME

2007

**MCU 1207 QUANTITATIVE TECHNIQUES FOR
MANAGEMENT**

(English)

THE OPEN UNIVERSITY OF SRI LANKA
BACHELOR OF MANAGEMENT STUDIES
MCU 1207 – QUANTITATIVE TECHNIQUES FOR MANAGEMENT
ASSIGNMENT TEST 2007
DURATION TWO (02) HOURS



DATE : 19th August 2007

Time : 10.00 a.m. – 12.00 noon

INSTRUCTIONS

Answer any four (04) questions.

Graph paper will be provided.

Use of non-programmable calculators is allowed.

- (1) a) If $x = 1$, $y = 3$ and $z = 4$, evaluate the following mathematical expressions.
- (i) $\frac{z(x^2 + y^2)}{x + y}$ (ii) $\frac{y(x + z)^2}{\sqrt{y^2 + z^2}}$
- b) Factorise the following
- (i) $x^2 + 5x - 14$ (ii) $y^4 + x^2y^2 - x^2 - y^2$
- c) Solve the following equations
- (i) $x^2 - 7x + 10 = 0$ (ii) $\begin{cases} x + 2y = 11 \\ 3x - y = 5 \end{cases}$
- d) There are two classes for Q.T., class 1 and class 2. When 10 students from class 1 joins class 2, the numbers of students in both classes become equal. If this does not happen and when 10 students of class 2 cross over to class 1, then the number of students in class 1 is twice the number of students in class 2.
Find the number of students in each class.
- (2) (a) Solve the following expression without using Log tables.
$$\frac{\text{Log}(64) + \log(27) - \text{Log}(125)}{\text{Log}(2.4)}$$
- (b) Simplify the expression.
$$\frac{a^3b^2(a^2 - b^2)}{(a + b)(a^2b)^{3/2} \sqrt{b}}$$
- c) Solve the following equation
$$\frac{x + \text{Log}_{10}x}{x + 2} = \frac{\text{Log}_{10}x^2}{4}$$

- 3) The fixed cost of a certain manufacturing company is 600 and the variable cost (the cost that directly increases with the number of units produced) per unit is 10. The revenue function is given by $80x - x^2$.
- Find the total cost function. (key: Total cost = fixed cost + variable cost)
 - Draw the graphs; revenue function and total cost function on the same axis (consider range of x as 0 to 80).
 - Find the range of value of revenue for which production is profitable.
 - To obtain the maximum profit for the company, how many units should be sold? What is the total revenue and the total cost at this level?
- 4) a) In an arithmetic progression (AP) the first term is 5 and the common difference is 7.
- Write down the first four terms of the progression.
 - What is the 8th term in the series?
 - Find the sum of the first six terms.
- b) In a geometric progression the first term is 3 and the common ratio is 2.
- What is the 8th term in the series?
 - Find the sum of the first five terms.
- c) In an arithmetic progression, the first term is twice the common difference and the 8th term is 27. Find the sum of the first five terms.
- 5) a) Find the differential coefficient of the following function with respect to x .
 $2x^2 + 7(x+3)$
- b) The profit earned by selling “ x ” items is given by the variable “ y ” where $y = 50 + 70x - 7x^2$. How many items should be sold to earn the maximum profit?
- c) Integrate the following functions with respect to x .
- $3x^2 + 4x + 7$
 - $\sqrt{x} + \frac{1}{\sqrt{x}}$
- d) Evaluate the following definite integral
 $\int_1^5 x^2 + 5x + 4 \, dx$

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