



EASTERN UNIVERSITY, SRI LANKA

FIRST EXAMINATION IN SCIENCE 2005/2006

FIRST SEMESTER (Aug./Sep.'2007)

CC 103 - BIO MATHEMATICS

Proper & Repeat

Answer all questions

Time: One hour

1. (a) Simplify the following:

i. $\left(\frac{8abc^2}{27a^2b^3c}\right) \div \left(\frac{4a^2b}{9c^3}\right) \times \left(\frac{bc^{-1}}{a^{-2}}\right)^2$,

ii. $\frac{\log_4\left(\frac{k}{2}\right) + \log_4 2}{\log_{64} k}$.

(b) Factorize the following:

i. $9x^2 - 12x + 4$,

ii. $ab(x^2 - y^2) - xy(a^2 - b^2)$.

(c) Solve the following equations.

i. $3 \times 9^{2x-1} = 27^{-x}$,

ii. $\log(5x - 6) + \log(2x + 3) = \log(10x^2 - 3x - 6)$.

(d) i. Show that $4 \log_4 6 = 3 \log_8 9 + 2$.

ii. Find the equation of straight line passing through (1, 3) and parallel to

$2x - y + 3 = 0$.

2. (a) Find the limit value of the following:

i. $\lim_{x \rightarrow \sqrt{3}} \frac{x^2 - 3}{x - \sqrt{3}}$,

ii. $\lim_{x \rightarrow \infty} \frac{7 - 3x^2}{4x^2 + 3x - 2}$,

iii. $\lim_{x \rightarrow 2} \frac{\sqrt{x+7} - 3}{x - 2}$.

(b) Differentiate the following with respect to x .

i. $y = \ln \left(\frac{x^2 + 1}{x^2 - 1} \right)$,

ii. $y = (x^2 + 3)^4$.

(c) Integrate the following:

i. $\int x e^x dx$,

ii. $\int \frac{\ln x}{x \sqrt{(\ln x)^2 + 2}} dx$.

(d) Find the maximum and minimum points of the function $y = 3x^2 - x^3$.