EASTERN UNIVERSITY, SRI LANKA

FIRST YEAR FIRST SEMESTER EXAMINATION IN AGRICULTURE 2008/2009

(March-May 2010)

AEN 1102 – BASIC MATHAMATICS (1:15/00)

Answer all questions
Time: 1 hour

1. A). Solve the following problems

a. $5 \log_3 6-(2 \log_3 4 + \log_3 54)$

b. $\frac{36x^2y}{(8x^6)^{\frac{1}{3}}}$

c. Find the coordinate of the midpoint of the straight line joining (1,2) and (3,1)

d. Find the equation of the tangent at the point (-3,5) to the circle $x^2+y^2-4x+2y-27=0$

e. $\frac{3^{n+4}-6\times3^{n+1}}{3^{n+2}\times7}$

B) (a) Using the letters in the word "**Congratulations**", write how many 15- letter arrangement with **no repetitions** are possible if:

i. first letter is vowel.

ii. Vowels and consonants alternate, beginning with consonant

(b) To arrange 24 different ways of sitting around a circular table, how many people are needed, if all of them are participating in each arrangement?

2. A). Evaluate the followings

a. $\lim_{n\to2}\left[12\times\frac{(\sqrt{x+7}-3)}{x-2}\right]$

b. $\lim_{n\to\infty}\left[\frac{4x^4+5x^3+3}{2x^4+3x}\right]$

(PTO)

c. Differentiate the following with respect to x

i. $y = \frac{(x^2+1)}{(x^3-2x)}$

ii. $y = \frac{(2x+1)}{x^2}$

d. If $y = x^3 - 3x^2 - 9x + 27$, find the **dx/dy** and hence find **d^2y/dx** when the gradient **zero**. Show the curve that has a stationary point when x= -1 and also show that is at maximum point.

e. Find the following integrals.

i. $\int \left(\frac{x^4+x}{\sqrt{x}}\right) dx$

ii. $\int \sqrt{(x^2+2x)}\ (x+1)dx$

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