

EASTERN UNIVERSITY, SRI LANKA

FIRST YEAR FIRST SEMESTER EXAMINATION IN AGRICULTURE – 2010/2011

(Feb/March 2012)

AE 1102 – APPLIED MATHEMATICS FOR AGRICULTURAL SCIENCE (1:15/00)

Answer all questions

Time: One hour

01. (a) i. Find the equation of a line passing through the points (1, 2), (3, 1).
ii. What is its y intercept ?

(b) Evaluate the following limits:

i. $\lim_{x \rightarrow 1} \frac{x^2 - 1}{x^2 + x - 2}$;

ii. $\lim_{x \rightarrow \infty} \{(x^2 + 1)^{1/2} - x\}$.

(c) i. Let $A = \begin{pmatrix} 2 & 0 & 9 \\ -1 & 6 & 11 \\ 4 & 8 & -1 \end{pmatrix}$, $B = \begin{pmatrix} 1 & 2 & 3 \\ -1 & 0 & 0 \\ 1 & -1 & -4 \end{pmatrix}$ and $C = \begin{pmatrix} 2 & 0 & -5 \\ 3 & 7 & 2 \\ -1 & 0 & -1 \end{pmatrix}$.

Find the matrix $2A+B-2C$.

ii. Find the matrix BA if

$$A = \begin{pmatrix} 5 & 4 & 3 \\ 4 & 3 & 2 \end{pmatrix} \text{ and } B = \begin{pmatrix} 4 & 3 \\ 5 & 6 \\ 3 & 2 \end{pmatrix}.$$



(PTO)

2. (a) Differentiate the following functions with respect to the variable x:

i. $y = (4x^3 - 2x + 1)(3 - 5x^2)$;

ii. $y = (4x^2 + 3x)/(2x + 1)$;

iii. $y = (2x^2 + 2x)^3 / (x^3 + 5x^2 + 2)^4$;

iv. $y = \log(x^2 + 2x/3x^2 + 4x)$.

(b) Integrate the following with respect to x;

i. $(2x + 1)(x - 2)$;

ii. $X^2/(x^3 + 11)$;

iii. $\cos 10x$;

iv. $(2x + 5)/(2x^2 + 10x + 1)$.