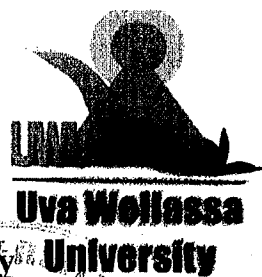


Uva Wellassa University
Faculty of Animal Science and Export Agriculture
B.Sc. in Animal Science / B.Sc. in Aquatic Resource Technology



End Semester Examination January/February 2016
Year I Semester II

Mathematics for Biological Sciences (EAG 102-0)

Instructions to Candidates

Answer **All** Questions

No of Questions : Four (04) Questions

No of Pages : Two (02) pages

Time : Two (02) hours

Question 01

1.1 Let $A = \begin{pmatrix} 1 & 0 & 2 \\ 0 & 2 & -1 \\ 2 & 1 & 0 \end{pmatrix}$ and $B = \begin{pmatrix} 1 & 5 & 0 \\ -2 & 1 & 2 \\ 0 & -1 & 2 \end{pmatrix}$,

Find;

a) $2A - 3B$ (10 Marks)

b) $\frac{1}{2} (A \times B)$ (10 Marks)

1.2 Consider the following two functions $f(x)$ and $g(x)$;

$$f(x) = -2x + 5$$

$$g(x) = x^2 - 5$$

a) Find the inverse of $f(x)$ and $g(x)$ and comment whether inverse is a function or not. (10 Marks)

b) Find the composite function of $f(g(x))$. (05 Marks)

Question 02

Find the limits of following functions.

2.1 $\lim_{x \rightarrow 3} 2x^2 - 3$

(05 Marks)

2.2 $\lim_{x \rightarrow 3} \frac{x^2 - 9}{x^2 - 3x}$

(05 Marks)

2.3 $\lim_{y \rightarrow \infty} \frac{y^3 + y^2 - 4}{3y^3 - 2}$

(05 Marks)

Question 03

3.1 Find the derivative of following functions given below with respect to x .

a) $y = x^3 - 2x^2 + 3$

(05 Marks)

b) $y = \frac{\sin x}{\cos x}$

(08 Marks)

c) $y = e^x \ln x$

(07 Marks)

3.2 Production cost ($f(x)$) of a metal cylinder is given by following equation which is only depend on the radius (r) of the cylinder. Find the radius of cylinder which gives the minimum cost by using method of derivative.

$$f(x) = r^2 - 8r + 20$$

(10 Marks)

Question 04

Integrate the following functions with respect to x .

4.1 $\int x^3 - x^{-2} + 2 \, dx$

(05 Marks)

4.2 $\int \frac{2x+1}{2x^2+2x+3} \, dx$

(05 Marks)

4.3 $\int_0^{\pi/2} \cos x + \sin x \, dx$

(10 Marks)