Uva Wellassa University
Faculty of Animal Science & Export Agriculture
B.Sc. in Export Agriculture / B.Sc. in Tea Technology & Value Addition / B.Sc. in Palm & Latex Technology and Value Addition

Uva Wellassa University

End Semester Examination September/ October2015
Year I Semester I

Mathematics for Biological Sciences (EAG 101-1)

Instructions to Candidates

Answer **All** questions.

No. of questions : Two (02)
No. of pages : Two (02)
Total marks allocated : 100%
Time : One (01) hour
Use standard symbols without definition.
Scientific calculators are allowed.

Question 1

1.1 Draw the graph of the following function.

$$f(x) = \begin{cases} 9 - x; & if\ x \leq 2 \\ x^2 - 2; & if\ x > 2 \end{cases}$$

(10 marks)

1.2 A closed cylindrical "**Can**" has a surface area $120\pi\ cm^2$. Express the volume of the "**Can**" as a function of its radius r.

(10 marks)

1.3 Find each of the following limits.

a) $\lim_{x\to 2} 3x^2 - 5x + 2$ (5 marks)

b) $\lim_{x\to 2} \frac{x^2-4}{x^2+5x+6}$ (5 marks)

c) $\lim_{x\to\infty} \frac{x^3+x-3}{3-2x-3x^3}$ (5 marks)

1.4 Simplify the following expression.

$$\left(\frac{2x^2y^0z^{-5}}{14y^{-1}xz^3}\right)$$

(8 marks)

1.5 Expand the following expression.

$$\log_7(x^2\sqrt{1-y^2})$$

(7 marks)

Question 2

2.1 Find the derivative of the following function using the standard definition.

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

(10 marks)

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

a) $y = x^3 \cos 2x$ (5 marks)

b) $y = \frac{x^2+3x+5}{x+1}$ (5 marks)

c) $y = e^x \ln x$ (5 marks)

2.3 Integrate the following functions with respect to x.

a) $\int \left(\frac{2x+1}{2x^2+2x+3}\right) dx$ (5 marks)

b) $\int (\sin 3x + 5e^{5x} + x^3)\, dx$ (5 marks)

c) $\int (2x-1)^4\, dx$ (5 marks)

2.4 Find the value of, $\int_0^{\pi/2} (\sin x + \cos 2x)\, dx$. (10 marks)