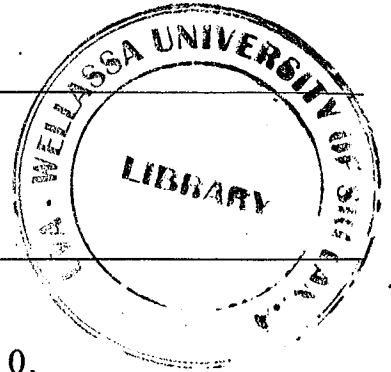


Uva Wellassa University, Sri Lanka
End Semester Examination –September/October 2012
EAG 102-0 Mathematics for Biological Sciences



Time: Two (02) hours

Total Four (04) questions.
Answer all questions.



01. (i) Find the solutions x_1 and x_2 for the equation of $x^2 - px + q = 0$.

(ii) Using part (i) show that;

a.) $x_1 + x_2 = p$

b.) $x_1 \cdot x_2 = q$

(iii) Solve the equation $x^2 - x = x + 8$

(iv) Solve and Graph $3x(x-1) - 2 \leq 2x(x-1)$

(25 Marks)

02. (i) If $A = \begin{pmatrix} 2 & -1 & 2 \\ 3 & 0 & 4 \end{pmatrix}$ and $B = \begin{pmatrix} -3 & 4 \\ 5 & 2 \\ -1 & 1 \end{pmatrix}$. Then find the product AB .

(iii) Show that $\log_a b = \frac{1}{\log_b a}$; $a, b \neq 1$

(20 Marks)

03. a) Find each of the following limits, if they exist:

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

$$ii.) \lim_{t \rightarrow 2} \frac{t^2 - 4}{t - 2}$$

b) Determine whether the following functions are continuous at the given point c :

$$i. f(x) = \frac{3}{x+4} \quad \text{at } c = -3$$

$$ii. g(t) = \begin{cases} \frac{1}{t-2}, & \text{if } t \neq 2 \\ 3, & \text{if } t = 2 \end{cases} \quad \text{at } c = 2$$

$$iii. h(x) = \begin{cases} x^2 + 1, & \text{if } x \neq 1 \\ 2, & \text{if } x = 1 \end{cases} \quad \text{at } c = 1$$

c) Differentiate each of the following functions with respect to x .

$$i. f(x) = x^4 - x^2 + 3x - 5$$

$$ii. g(x) = [x^2 - 2x + 5]^2$$

$$iii. R(x) = x^2 \cos x + \tan x - 2x$$

(30 Mar

04. Evaluate the following integrals.

$$i.) \int x^2 e^x dx$$

$$ii.) \int_0^2 (2x^3 - 6x + \frac{2x}{1+x^2}) dx$$

$$iii.) \int_0^2 (6x^2 + 4x + 5) dx$$

(25 Mar