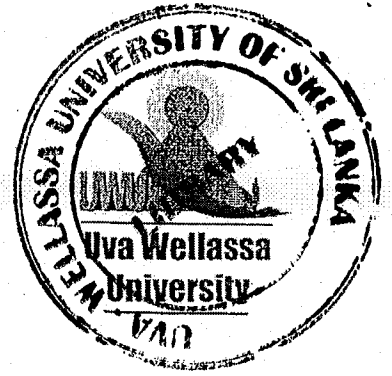


UvaWellassa University, Sri Lanka  
End Semester Examination – September 2012  
BGE 131-3 / SCT 102-3 Basic Mathematics and Engineering  
Technology  
and Repeat



Time: Three (03) hours

Index number: .....

Part C

01.) I. Solve the quadratic inequality  $2x^2 - 3x \leq 2$

II. Solve  $\ln(x-1) + \ln(3x-2) = \ln 2x$

(30 marks)

02.) If  $p(x)$  is the total value of the production when there are  $x$  workers in a plant, then the *Average Productivity* of the work force at the plant is

$$A(x) = \frac{p(x)}{x}$$

I. Find  $A'(x)$

II. Show that  $A'(x) > 0$  if  $p'(x)$  is greater than the Average Productivity.

(30 marks)

03.) I. Evaluate the following integrals.

i.)  $\int_0^1 x^2(x^3 + 1)^3 dx$

ii.)  $\int_0^1 x^2 e^x dx$

II. Prove that  $\int_a^b x^2 dx = \frac{1}{3}(b^3 - a^3)$

(40 marks)