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 $\int_a^b x^2\,dx = \frac{1}{3}\left(b^3 - a^3\right)$

(40 marks)