



Uva Wellassa University
Faculty of Management

Degree of Bachelor of Business Management in Entrepreneurship and Management
THIRD YEAR FIRST SEMESTER EXAMINATION - FEBRUARY \ MARCH 2012
EMG 361-2 Computational Finance



Part C – Essay Questions

Answer only Two (02) questions from Part C

Marks allocation: 50 Marks

01.

a. Find the Taylor expansion to fourth order of $\cos x$ about $x=0$.

(05 Marks)

b. Consider the following table.

Table 01

i	0	1	2	3	4
x_i	$-\frac{\pi}{2}$	$-\frac{\pi}{3}$	0	$\frac{\pi}{3}$	$\frac{\pi}{2}$
y_i	0	$\frac{1}{2}$	1	$\frac{1}{2}$	0

i) Find the quadratic Lagrange interpolation polynomial using nodes $x_0 = -\frac{\pi}{2}$, $x_1 = -\frac{\pi}{3}$ and $x_2 = 0$

(05 Marks)

ii) Get the approximate value of $f(-\frac{\pi}{4})$ using above Lagrange interpolation polynomial.

(05 Marks)

iii) Find the linear Spline interpolation polynomial for data in Table 01.

(05 Marks)

iv) Get the approximate value of $f(-\frac{\pi}{4})$ using above Spline interpolation polynomial.

(05 Marks)

02.

a.

i) Write the Taylor series expansion of $f(x) = e^x + 1$ with degree 4.

(05Marks)

ii) Find the truncation error, of the above Taylor series expansion with Lagrange Form.

(05Marks)

b.

i) Explain the Bisection method for finding the real root of an equation $f(x)=0$, within $[a,b]$.

(05Marks)

ii) Find the real root of the function $f(x)=0$ within $[2,3]$ using Bisection method, where $f(x) = x^3 - 2x - 5$ and $\epsilon=0.1$.

(10Marks)

03.

a. Convert the following decimal numbers into binary number format.

i) 12

ii) 12.5

iii) -13.625

(03Marks)

b. Convert the following binary numbers into decimal number format.

i.) 1101

ii.) -1.1101

(02Marks)

c. Find the real root of the function $f(x)=0$ by using the Newton Raphson method ,where

$f(x) = \sin x - 1$ and $\epsilon=0.01$ with an initial approximation of $x_0 = \frac{\pi}{4}$.

(10Marks)

d. Find the real root of the function $f(x)=0$ within $[0,1]$, by using Secant method where

$f(x) = x^3 - x - 1$ and $\epsilon=0.1$

