BITI 1223 – CALCULUS AND NUMERICAL METHODS

TUTORIAL 9 : POLYNOMIAL EVALUATION AND ERRORS

ANSWER ALL QUESTIONS.

Polynomial Evaluation

1. Evaluate the total number of calculation in the polynomial below

$$p(x) = 3 - 4x - 5x^2 - 6x^3 + 7x^4 - 8x^5$$

by using

a) Simplest method
b) Recursive method
c) Nested multiplication method

Error

2. What is the definition of error?

3. Define what is the definition of relative error?

4. Find the error E_x , relative error R_x and state the number of significant digits in the final answer for
   a) $x = 2.71828182$, $\hat{x} = 2.7182$
   b) $y = 98,350$, $\hat{y} = 98{,}000$
   c) $z = 0.000068$, $\hat{z} = 0.00006$

5. Perform the following computation of

$$\frac{7}{12} - \frac{1}{15}$$

by using
   a) Four digit rounding arithmetic
   b) Four digit chopping arithmetic

6. Use technique of algebraic expression reformulation to avoid the **loss-of-significant error** in solving the equation $x^2 - 26x + 1 = 0$.