King Fahd University of Petroleum and Minerals
College of Computer Sciences and Engineering

CISE 301 – Numerical Methods (T152)

Homework # 05 (due date & time: Sunday 27/03/2016 during class period)

*** Show all your work. No credit will be given if work is not shown! ***

Problem 1 (40 points): Given the data:

x	1	2	3	5	7	8
$f(x)$	3	6	20	99	290	443

(a) Calculate $f(4)$ using Newton's interpolating polynomials of order 1 through 4. Choose your base points to attain good accuracy.
(b) Utilize Eq. (18.18) to estimate the error for each prediction.

Problem 2 (30 points): Repeat **Problem 1 – Part (a)** using Lagrange polynomials of order 1 through 3.

Problem 3 (30 points): Use Newton's interpolating polynomial to determine y at $x = 7$. Order your points to attain optimal accuracy and convergence.

x	0	1	2	5.5	11	13	16	18
y	0.5	3.14	6.3	8.9	10.2	9.15	7.2	5.2