Menoufia University
Faculty of Engineering, Shebin El-Kom
Electrical Engineering Department
Postgraduate-Ph.D
Final Term Exam



Subject: Protection of electric power system

Code: ELE 701 Year: 2019/2020 Time Allowed: 3 hours Exam Date: 17/ 08/2020

Answer the following questions

Ques.1:

- a) Derive the three-sample algorithm used for estimating the frequency of AC signal.
- b) What is the importance of system frequency estimation?
- c) Considering a signal sampled at 800 Hz where the samples are listed in the following table:

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
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Find:

- I- The frequency of this signal.
- II- The phasor of this signal using both the three sample, recursive DFT, and non-recursive DFT algorithms.
- III- Drawing the computed phasor in the time domain.
- IV- Does the given signal contain harmonic component? Why?

Ques. 2:

Illustrate how least square method obtain the fundamental phasor component overcoming on the decaying of DC component.

Ques.3:

Illustrate a method to obtain the resistance and reactance from the measuring point till the fault point using only online samples (doesn't need phasor estimation).