Benha University
Faculty of Engineering at Shoubra
Electrical Engineering Department
3rd Year- Elec. Power and Machines

Mid-Term Exam.
Date: 21/4/2015
Computer Applications in EP&M
(EPE324), Time: 40 Minutes

- Answer all the following questions **in the same Paper**
- The exam consists of one page Two sides
- No. of questions: 2
- Total Mark: 15 Marks

Name: ..... Sec:..... B.N:.....

Question No#1: [6 Marks]

A generating station has a daily load cycle, while it is operating at **no load** in intervals from a time of 0 to 4, and from a time of 12 to 16. This station is operating at a load **increased linearly from 0 to 8 MW** at intervals from a time of 4 to 8, and from a time of 16 to 20 and it is operating at a load **decreased linearly from 8 MW to 0** at intervals from a time of 8 to 12, and from a time of 20 to 24. (Time in hours)

Write a Matlab program to Draw the daily load curve and find

(i) The maximum demand
(ii) The units generated per day
(iii) The average load and
(iv) Load factor.

Question No#2: **[9 Marks]**

Three parallel three-phase loads are supplied from a 2.07 kV rms, 50-Hz three-phase supply. The loads are as follows:

Load 1: A balanced resistive load that draws a total of 60 kW.

Load 2: A Y-connected capacitor bank with a total rating of 160 kvar.

Load 3: A 150 HP motor operating at full-load, 93.25 percent efficiency, and 0.6 lagging power factor.

Write a MATLAB program to

a) Find the total system kW, kvar, power factor, and the supply current per phase
b) If a Y-connected capacitor bank is connected in parallel with the loads. Find the total kvar and the capacitance per phase in μF to improve the overall power factor to 0.8 lagging. What is the new supply current per phase
c) If the resistive load and induction motor are operating but the capacitor bank is switched off. Find the total complex power, power factor, and the supply current.

Best Wishes

Dr. Essam M. Shaalan

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Question No#1: [6 Marks]

A generating station has a daily load cycle, while it is operating at **no load** in intervals from a time of 0 to 2, and from a time of 12 to 14. This station is operating at a load **increased linearly from 0 to 16 MW** at intervals from a time of 2 to 8, and from a time of 14 to 20 and it is operating at a load **decreased linearly from 16 MW to 0** at intervals from a time of 8 to 12, and from a time of 20 to 24. (Time in hours)

Write a Matlab program to Draw the daily load curve and find

(i) The maximum demand
(ii) The units generated per day
(iii) The average load and
(iv) Load factor.

Question No#2: **[9 Marks]**

Three parallel three-phase loads are supplied from a 4.07 kV rms, 50-Hz three-phase supply. The loads are as follows:

Load 1: A balanced resistive load that draws a total of 120 kW.

Load 2: A Y-connected capacitor bank with a total rating of 320 kvar.

Load 3: A 300 HP motor operating at full-load, 93.25 percent efficiency, and 0.6 lagging power factor.

Write a MATLAB program to

a) Find the total system kW, kvar, power factor, and the supply current per phase
b) If a Y-connected capacitor bank is connected in parallel with the loads. Find the total kvar and the capacitance per phase in μF to improve the overall power factor to 0.8 lagging. What is the new supply current per phase
c) If the resistive load and induction motor are operating but the capacitor bank is switched off. Find the total complex power, power factor, and the supply current.

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Question No#1: [6 Marks]

A generating station has a daily load cycle, while it is operating at **no load** in intervals from a time of 8 to 12, and from a time of 20 to 24. This station is operating at a load **increased linearly from 0 to 8 MW** at intervals from a time of 0 to 4, and from a time of 12 to 16 and it is operating at a load **decreased linearly from 8 MW to 0** at intervals from a time of 4 to 8, and from a time of 16 to 20. (Time in hours)

Write a Matlab program to Draw the daily load curve and find

(i) The maximum demand
(ii) The units generated per day
(iii) The average load and
(iv) Load factor.

Question No#2: **[9 Marks]**

Three parallel three-phase loads are supplied from a 207 kV rms, 60-Hz three-phase supply. The loads are as follows:

Load 1: A balanced resistive load that draws a total of 180 kW.

Load 2: A Y-connected capacitor bank with a total rating of 480 kvar.

Load 3: A 450 HP motor operating at full-load, 93.25 percent efficiency, and 0.6 lagging power factor.

Write a MATLAB program to

a) Find the total system kW, kvar, power factor, and the supply current per phase
b) If a Y-connected capacitor bank is connected in parallel with the loads. Find the total kvar and the capacitance per phase in μF to improve the overall power factor to 0.8 lagging. What is the new supply current per phase
c) If the resistive load and induction motor are operating but the capacitor bank is switched off. Find the total complex power, power factor, and the supply current.

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Question No#1: [6 Marks]

A generating station has a daily load cycle, while it is operating at **no load** in intervals from a time of 6 to 12, and from a time of 18 to 24. This station is operating at a load **increased linearly from 0 to 10 MW** at intervals from a time of 0 to 3, and from a time of 12 to 15 and it is operating at a load **decreased linearly from 10 MW to 0** at intervals from a time of 3 to 6, and from a time of 15 to 18. (Time in hours)

Write a Matlab program to Draw the daily load curve and find

(i) The maximum demand
(ii) The units generated per day
(iii) The average load and
(iv) Load factor.

Question No#2: **[9 Marks]**

Three parallel three-phase loads are supplied from a 107 kV rms, 50-Hz three-phase supply. The loads are as follows:

Load 1: A balanced resistive load that draws a total of 80 kW.

Load 2: A Y-connected capacitor bank with a total rating of 180 kvar.

Load 3: A 250 HP motor operating at full-load, 93.25 percent efficiency, and 0.6 lagging power factor.

Write a MATLAB program to

a) Find the total system kW, kvar, power factor, and the supply current per phase
b) If a Y-connected capacitor bank is connected in parallel with the loads. Find the total kvar and the capacitance per phase in μF to improve the overall power factor to 0.8 lagging. What is the new supply current per phase
c) If the resistive load and induction motor are operating but the capacitor bank is switched off. Find the total complex power, power factor, and the supply current.

Best Wishes

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