



- 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  $\mu\text{F}$  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*