

## Assignment-2

1. Problem: At a location in India, it is necessary to supply 300 kW of 60-Hz power. The only power sources available operate at 50 Hz. It is decided to generate the power by means of:  
(i) without an electronic circuit/automation, (ii) with an electronic circuit/automation.

Suggest/design the schemes with the specification of additional components/equipment intended for use to achieve the target.

2. A 20-kVA, 440-V, 50-Hz, Y-connected synchronous generator requires a field voltage of 100 V to build up the rated terminal voltage at the rated current of 26 A. The generator's synchronous impedance is  $1\Omega$ . Design the field voltage control with support from electronics circuit/automation. Mention the firing angle of the thyristor, if used.
3. The figure shows a generator supplying a load. A second load is to be connected in parallel with the first. The generator has a no-load frequency of 51.0 Hz and a slope  $S_p$  of 1 MW/Hz. Load 1 consumes 1000 kW of real power, while load 2 consumes 800 kW. (a) Before the switch is closed, what is the operating frequency of the system? (b) After load 2 is connected, what is the operating frequency of the system? (c) After load 2 is connected, what action could an operator take to restore the system frequency to 50 Hz?

