



**Answer the following questions**

**Ques.1:**

- a)\_ Compare between conventional and smart grids describing the basic parts of smart grid?
- b)\_ How the reclosure and sectionalizer used together to identify the faulty section indicating to the drawbacks of this scheme?
- c)\_ According to the smart grid vision, the faulted section is isolated via appropriate settings for the switches along the feeders using suitable control strategy. These control strategies of the switches are categorized into centralized, decentralized, and autonomous controls.

I)\_ Compare between these strategies from communication hops number, the utilized communication hops reliability, and fault detection reliability point of view?

II)\_ Calculate the communication hops number and communication hops reliability for each control strategy if a fault occurred between secondary substations 8 and 9 in the IEEE 33-bus 11 kV test radial distribution feeder shown in the following Figure?

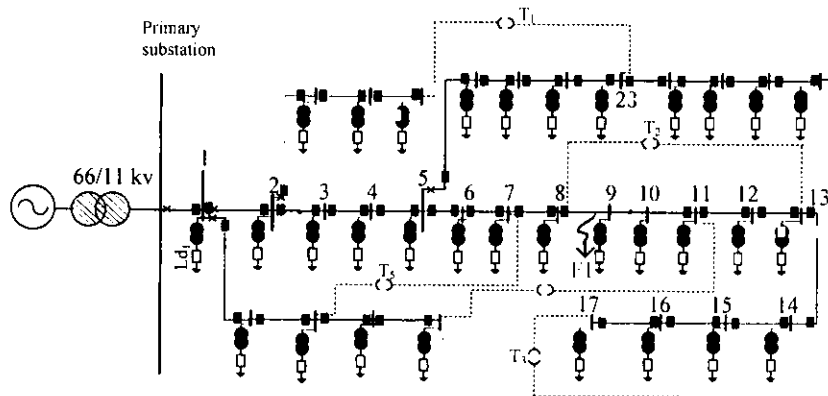


Fig.1. IEEE 33-bus 11 kV test feeder with implemented agents

**Ques. 2:**

- a)\_ Derive used expressions for locating phase-to-phase and ground faults in a transmission line by distance relay.
- b)\_ Define the islanding illustrating the islanding types.
- c)\_ Illustrate only three islanding detection techniques.

Good Luck ..... Dr. Mahmoud Elsadd (01063718439 & 01201910926)