ELECTROCUTION – EUREKA
FAULT LOCATION DETECTOR IN POWER SYSTEM

The <u>FAULT LOCATION DETECTOR SYSTEM</u> detects location of the fault in Power transmission system. It also protects the Power system from the damage by actuating a relay. It is primarily used to detect and locate the location of the fault (single Line to ground) in transmission line system. Its sensing element must be placed in contact with the transmission cable to be able to monitor when the power cable is drawing an excessive current. The circuit must be designed for remotely sensing the fault. It has always been an interest for engineers to detect and locate the faults in the power system as early as possible. Fast clearing and restoration is very essential as it not only provides reliability but sometimes also stops propagation of disturbances which may lead to blackouts.

TASK:

Participants are required to design a ICs based system which consists of a current sensor used to sense the current which is used by relay to trip the line in the power cable and design an algorithm to detect the location of the fault. The designer must create sufficient power supplies to drive the LED's signifying the power levels of the load and a dynamic relay network to actuate an alarm for overload conditions. The circuit must also consist of a display system (may be LCD panel) indicating the location of the fault.

The task is divided into 2 phases:

Phase 1: This is a qualifying round. The circuit design must be able to detect the fault in system. The system will also be judged for its ability of how precisely it locates the location of fault. The transmission line can be assumed of resistors or inductances only. Circuit can consist of only IC's, resistors, inductors, transistors and relays. The circuit will also be evaluated on the basis of algorithm used to locate the location of the fault. The system can be presented on proteus (simulation only).

Phase 2: In this round, hardware model of the device would be tested on a regular AC supply of 220V, 50Hz. the device will be judged on the basis of the accuracy of the display
device arrangement and how efficiently and quickly the system can respond to a fault.

MARKING:

The marking will depend on the working, principles used, accuracy and cost of the circuit.

- 30 points will be given for the synopsis which will include schematic diagram, cost estimation, and main features of your implementation.

- 50 points will be awarded for successfully generating a valid LCD response in Phase 1, indicating the location of the fault.

- 70 points will be awarded for successfully generating an alarm sequence in case the fault current exceeds 2A in Phase 2.

- Additional 30 points would be awarded on the basis of cost cutting methods used in the implementation.

- 70 points will be awarded for successfully generating the display response in Phase 2 showing the fault current and location of fault.
  Marking would be done on the basis of its conformity with the levels defined in the task previously.

RULES:

Each team can have a maximum of four participants.
Judges decision will be final and binding.

Participants should bring their own laptops, if necessary.

If any other material is required, the participants may ask for the same through   e-mail or phone at least 10 days prior to the competition.

**Teams must mail the soft copy of synopsis of their device to "electrocution.troika@gmail.com" by
12 midnight "1 February 2017". Teams will be shortlisted for the main event on the basis of their synopsis. They would be notified of their selection via email. Shortlisted teams will have to appear on the event day with their device and synopsis. Further judging would be done as mentioned before.**

Please regularly check the website for further updates on the competition and the change in rules and regulations, if any. ☺

All the Best! Happy Troika