1) Explain the fault management process in the case of short circuit fault in medium voltage overhead line. What is the role of modern automation in the process.

2) Remote control of disconnectors is traditional feeder automation function. Explain, what else functions there could be in feeder level (disconnector stations, MV/LV substations, LV network) as part of modern distribution automation system.

3) Explain briefly what kind of communication is typically used in the following applications of distribution automation and why:
   a) Communication inside substation
   b) Communication between control center and substations
   c) Customer meter reading

4) Calculate the reliability indices SAIFI, SAIDI and MAIFI in the following simple feeder. Calculate the indices also in case when the disconnector is remote controlled (switching time is 5 minutes) and in the case when the disconnector is replaced by a circuit breaker. What else method could be used to evaluate reliability?

   **Failure rate**  = 5 faults / 100 km, a

   **Temporary failure rate** = 40 faults / 100 km, a

   **Switching time of disconnector** 1 h, repair time 3 h

   Area 1
   Line length 20 km
   Number of customers 400

   Area 2
   Line length 40 km
   Number of customers 200