Sem-VII / Process Automation / INST - CBGS

10-12-15

QP Code : **6006**

(3 Hours) [**Total Marks : 80**

N.B. : (1) Question no. **1** is **compulsory**
(2) Attempt **any three** questions from the remaining **five** questions.
(3) Assume any suitable data of necessary.

1. Answer the following :- 20
   (a) Explain redundancy used in DCS. Justify the same
   (b) What is SIL? What are its levels and significance with process safety?
   (c) Give the specifications of PLC. Name its vendors.
   (d) SCADA is a real time system. Explain.

2. (a) What is automation? Give its significance. 5
   (b) Explain types of automation. 5
   (c) Explain the need of DCS integration with PLC. Also explain the methods of integration. 10

3. (a) Compare PLC, DCS and SCADA. 10
   (b) Prepare PLC ladder diagram for Stirred Tank Heater for the given sequence of process. 10
      (i) Fill the tank upto high limit.
      (ii) Heat and stir the liquid for 29 min.
      (iii) Empty the tank upto low limit.
      (iv) Repeat from step-1

   The hard ware has the following types of switches
      (i) Start PB in NO, STOP PB in NC
      (ii) NO type of limit Switches

   Draw GUI, do I/o listing and ladder diagram. Select remaining hardware that is necessary.

4. (a) Give different types of DCS displays. State significance of each type. 10
   (b) What is scan interval of SCADA? Give the factors that affect scan interval. 10

5. (a) Explain memory organization in PLC. 10
   (b) Explain general protocol structure used for communication between MTU and RTU of SCADA. Give an example.. 10

6. (a) What are protections layers? Explain their significance with reference to SIS. 10
   (b) What is MES? Explain MES and ERP integration. 10

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