(3 Hours) [Total Marks: 80]

Note:

1. Question one is compulsory.
2. Solve any three from remaining and assume suitable data

Q1.	Solve any four	20
a.	What is Automation? Give its significance.	
b.	Write a note on DCS flow sheet symbols.	
c.	Explain with the diagram Automation Hierarchy.	
d.	What are the terms SIS, SIL & IEC 61508. Explain briefly.	
e.	Classify the types of PLC. Name the vendors and manufacturers.	

Q2. a	What are the different types of DCS displays? Elaborate each type with an example.	10
b	Explain Hierarchical computer system structure for a large manufacturing complex system.	10

Q3.a	List out the types of input modules and output modules of PLC. Draw the block diagram of AC input module.	10
b	Develop a ladder diagram for bottle filling application for the following sequence.	10

    1. With a START motor should be ON till bottle is sensed.
    2. Bottle should be filled and FULL level is sensed, if empty provide logic.
    3. Motor starts again for next bottle filling.

    Include I/O Listing with addressing, program description and ladder sequence.

Q4.a	Discuss the features of SCADA. Also, explain functions of MTU & RTU.	10
b	Compare PLC-DCS-SCADA.	10

Q5. a	Why alarm management is important? Explain the Alarm Management Philosophy.	10
b	What are protection layers? How are they significant w.r.t. SIS.	10

Q6	Write a short note on any two.	20

    a. Factors affecting scan interval in SCADA system
    b. MES and ERP with application
    c. Memory organization in PLC.
    d. PLC-DCS Integration- Necessity and Methods.

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