

Duration: (3 Hours)

[Total Marks: 80]

N.B.: (1) Question No. 1 is Compulsory.

(2) Attempt any three questions out of the remaining five.

(3) Each question carries 20 marks and sub-question carry equal marks.

(4) Assume suitable data if required.

**Q1. Attempt any four** [20]

- a. Explain the requirements of Automation Systems. 5
- b. Discuss elements of computer aided measurement and control. 5
- c. Explain the working of a typical actuator. 5
- d. Explain cavitation for a control Valve. 5
- e. Explain in brief selection criteria of PLC. 5

**Q2.** [20]

- a. Explain the architecture of Industrial Automation system. 10
- b. Explain supervisory control and data acquisition (SCADA) with suitable diagram. 10

**Q3.** [20]

- a. Explain in brief the working of thermal sensors with suitable diagram. 10
- b. Explain different types of process control Valves. 10

**Q4.** [20]

- a. Explain PLC with block diagram of the components of PLC. 10
- b. Discuss different types of PLC and its advantages. Also explain the applications of PLC in industry with examples. 10

**Q5.** [20]

- a. Discuss the role of rover and end effector in the pick and place robot. 10
- b. Analyze the basic configuration and working of pick and place robot. 10

**Q6.** [20]

- a. Explain communication media in DCS in detail with a neat diagram. 10
- b. Explain DCS Supervisory Computer Tasks in detail. 10

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