Time: 3hours **Total Marks: 80**

N.B.: 1.Question No.1 is compulsory
2. Solve any THREE questions out of remaining FIVE questions.
3. Figure to the right indicate full marks.
4. Assume suitable data if required.

Q1	Solve any four from the following:	(20)
a)	Discuss different communication media used in SCADA with advantages and disadvantages.	
b)	Compare engineering workstation and operator workstation.	
c)	Classify PLC according to the arrangement of its components and explain them in brief.	
d)	What do you mean by ERP? Discuss its advantages.	
e)	Discuss SIL levels for low mode.	
Q2 a)	Draw and explain the generic architecture of DCS.	(10)
b)	Discuss protocol structure with respect to SCADA.	(10)
Q3 a)	Explain internal circuitry of PLC discrete AC input module.	(10)
b)	Discuss the characteristics of P, PI and PID controller with their advantages and disadvantages.	(10)
Q4 a)	Give different types of DCS displays with significance of each type.	(10)
b)	Develop a PLC ladder for the traffic control System. Your answer should include process sequence, I/O mapping, graphical user interface and ladder diagram.	(10)
Q5 a)	Compare PLC, DCS and SCADA	(10)
b)	Define scan interval and discuss the factors which affects the scan interval of SCADA.	(10)
Q6	Write short notes—(Any TWO)	(10)
	a) Database management System	(10)
	b) Safety in Instrumentation system	
	c) Retentive and non-retentive timers	(10)