Course: AUTOMATION IN POWER SYSTEMS   Semester: VII
Programme:B.TECH ELECRICAL & PSE   Course Code : PSEG483
Time: 03 hrs.   Max. Marks: 100

SECTION A

S. No.		Marks	CO
Q 1	List out the Discrete control and Analog control signals in an SCADA based substation.	4	CO1
Q2	Compare SCADA based and PMU based power system automation.	4	CO2
Q3	Discuss the need of CIS (customer information system)	4	CO4
Q4	Describe the need of Digital Fault Recorder Analysis Modules in power system automations	4	CO1
Q5	Discuss and compare Conventional and smart metering .	4	CO4

SECTION B

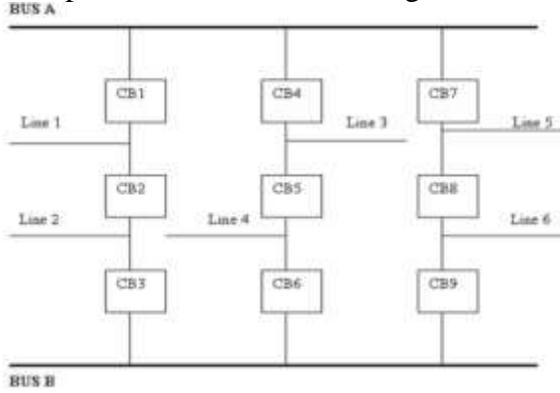|			
Q 6	Summarize the need of Planning, operation of SCADA in power systems.	10	CO3
Q7	Illustrate and discuss the Substation and feeder level automation.	10	CO1
Q8	The successful operation of a power system depends on the accurate tracking of the system load to match the generation. Explain the load forecasting needs for smooth control and efficient operation of the power system. **[OR]** Demonstrate the following protection issues in Power system automation with the help of an example? a) Dynamics in level of fault currents b) Bi-directional fault current c) False tripping Blinding of Protection	10	CO1
Q9	Illustrate and discuss in detail about Advanced Metering Infrastructure architecture and functional components.	10	CO4

SECTION-C [Internal choice between Q10 and Q11]

Q 10	The basic requirement of any automation system is the availability of data from the field, and the SCADA system brings in the required data to the energy control center for further processing and necessary control activity. Summarize Energy control center functions ,along with data flow with time frames and block diagrams	20	CO3
Q11	Distribution automation refers to the automation of all functions related to the distribution system using information collected from substation devices, devices deployed on feeders, and meters deployed at consumer locations. Thus, SCADA system that monitors, and controls distribution substations is considered a DA function. In the distribution automation(DA) operation master to individual IEDs are relayed through the concentrator. The polling frequency for DA IEDs may be smaller	20	CO1 and CO2

	(say, every 5-30s) than the every 2–5 s typically used by SCADA systems to collect periodic measurements and status from the IEDs in a distribution substation.
	
	   I. Illustrate how distribution automation can be done with the help of an example of feeder devices included in distribution automation
	   II. Illustrate the SCADA System with the help of following architecture
	       a)Typical modern EMS architecture, b)RTU software architecture. c)SCADA system data flow architecture.		

Q12	Reference Sequence for Breaker-and-a-half Bus Arrangement shown on Fig below . Further analysis will be presented for the bus arrangement from this figure. Describe and draw the flow chart for the following cases considering fault and Breaker Failure Logic: Case A :Sequence of opening corresponding breakers in case of fault on Line1 Case B : Sequence of opening corresponding breakers in case of fault on BUS A Note : Consider the necessary assumptions where required.	**C03**	