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UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

End Semester Examination, December 2017

Program: B Tech (Power System Engineering)   **Semester – VII**

Subject (Course): Automation in Power Industry   **Max. Marks   : 100**
Course Code   : PSEG 482   **Duration   : 3 Hrs**
No. of page/s: 02

Section – A

Answer All Questions   **5 x 4 = 20 Marks**

1. [CO3] Discuss about wireless communication technology option, in distribution automation.

2. [CO2, CO3] Explain about 'Modbus network application' in PLC communication between substations.

3. [CO1, CO2] Explain the basic requirements of communication in 'automation in power industry'.

4. [CO3, CO4] Briefly describe about DNP used in distribution power industry.

5. [CO1, CO4] Draw and explain about PAC with architecture.

Section – B

Answer All Questions   **4 x 10 = 40 Marks**

6. [CO2, CO3] "Different communication techniques are used for distribution automation applications". Discuss with a neat block diagram.

7. [CO2] Discuss in detail about the need and applications of industrial automation and power system automation and control.

8. [CO1, CO2] Explain briefly about the intelligent device that is used as protection and in power system automation industry.

9. [CO2, CO4] "Outage management is one of the most crucial processes in the operation of distribution network, having the goal to return the network from emergency state back to normal state" – justify with a neat sketch.

OR

10. [CO3, CO4] Explain about MODBUS network applied in PLC communication the automation substation.

Section – C

Answer All Questions   **2 x 20 = 40 Marks**

11. [CO3] The non-linearity of magnetic cores in CT and VT sets constrains on the measuring range and accuracy. The introduction of alternative sensing technology provides a large measuring range with high accuracy, integrated measurement and protection. Explain in detail the role of Current Transformer and Potential Transformer in view of technology development for applications in automation in power system.

12. [CO4] Explain with a neat sketch about the control logic and retrofit automation strategy that can be developed on 66kV/33kV distribution substation feeders.

OR

13. [CO2] Draw and explain the architecture and technology needed by 'Siemens' in power system automation structure.

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Section – A

Answer All Questions   **5 x 4 = 20 Marks**

1. [CO1, CO2] Explain about enterprise resources planning information system to coordinate the operation and processes followed in power industry.
2. [CO2,CO3] Draw and explain the conventional ladder diagram and ladder logic for NOT logic function with a real time example.
3. [CO3] Discuss the essential requirements of automation and control.
4. [CO2,CO4] "Different communication techniques are used for distribution automation applications". Discuss with a neat block diagram.
5. [CO4] Draw the typical SCADA architecture with interfaces with other enterprise systems.

Section – B

Answer All Questions   **4 x 10 = 40 Marks**

6. [CO2] Explain in detail the role of wireless communication technologies in the electrical utility industry.

7. [CO3, CO4] Discuss in brief about
 a)   Pad mount automated switchgear   b) Ring Main Unit

 8. [CO1, CO2] Explain about the unit which was developed with the aim of acting as an interface and communication unit between field instruments and SCADA system.

9. [CO2] Draw the pictorial view of

a) CIM Data Model Structure in Load model   [5M]

b) CIM Classes relationships in SCADA package   [5M]

OR

10. [CO4] Explain about typical power utility control hierarchy and discuss its different layers.

Section – C

Answer All Questions   **2 x 20 = 40 Marks**

11. [CO1, CO2] Explain in detail about the commonly accepted indices as defined by the IEEE and compare the performance of different distribution network and automation strategies.

12. [CO2, CO4] Draw and explain the architecture and technology designed by ALSTROM in power system automation structure.

OR

13. [CO1, CO2] During the visit to ISBT 33kV/11kV substation' it is noted that the controls are manual/automatic to the relays, the indication system and annunciation system is also of the 1990's. The authorities have decided to go for modernization of automated substation. What do you suggest to improve the system and make it a supervisory control? Name the features and benefits of your system.