B.E. Electrical (Electronics & Power) Engineering Eighth Semester
EP802 - Power System Operation & Control

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Notes : 1. All questions carry equal marks.
2. Students may solve the questions as per internal choice.
3. Due credit will be given to neatness and adequate dimensions.
4. Assume suitable data wherever necessary.
5. Illustrate your answers wherever necessary with the help of neat sketches.
6. Use of Non-programmable Electronics calculator is permitted.

1. a) Classify power system stability and explain the classification. **8**

b) Define the term Transient stability of a power system. Also Explain any one method to improve transient stability. **8**

OR

2. a) Explain and Derive the equal area criteria. How it is applicable to stability study? **8**

b) Explain with a neat sketch the concept of multimachine stability. **8**

3. a) Discuss briefly various compensations carried out in power system. **8**

b) State the necessity of reactive power control. Explain any one method of reactive power control. **8**

OR

4. a) Explain the phenomenon of sub subsynonymous resonance in power system operations and suggest remedies to overcome this problem. **8**

b) Draw and explain the effect of excitation in power system. **8**

5. a) What is Flexible A.C. Transmission system. Also state the problems of AC transmission system. **8**

b) Explain with the neat diagrams the operation of UPFC. **8**

OR

6. a) Explain with the neat diagram the operation of STATCOM. **8**

b) Explain with the neat sketch the operation of TCSC. **8**

7. a) Derive the co-ordination equation used for unit commitment (Neglecting Transmission loss). **8**

b) Discuss why? **8**
  i) Generally the fuel cost is taken as the operating cost in economic scheduling.
  ii) Power system always have some reserve capacity.

OR

8. a) The fuel inputs per hour of plants 1 and 2 are given as **8**

$$F_1 = 0.2P_1^2 + 40P_1 + 120\,RS/hr$$

$$F_2 = 0.25P_2^2 + 30P_2 + 150\,RS/hr$$

Determine the economic operating schedule and corresponding cost of generation if the maximum and minimum loading on each unit is 100MW and 25MW; the demand is 180MW and transmission losses are neglected. If the load is equally shared by both the units determine the saving obtained by loading the units as per incremental production cost.

b) Explain the different constraints encountered for economic operation of power system. **8**

9. a) Draw the block diagram of speed governing system. Explain the function of each component. **8**

b) Explain the dynamic response of two area system. **8**

OR

10. a) Explain with a block diagram load frequency control of an isolated power system. **10**

b) Define the terms. **6**
  i) Control area.
  ii) Area control error.
  iii) Load frequency control.

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