SUBJECT NAME: PSOC

SUBJECT CODE: EEE 031   **BRANCH: EEE**

1. What is the objective of power system control?
2. Why the frequency and voltage are to be regulated in power system?
3. What happens to frequency if the load on the generator increases?
4. Define per unit droop.
5. State the difference between P-f, and Q-lVl.
6. What decides the loading of generating stations?
7. What is the duty of the power system operator?
8. Explain the need for voltage and frequency regulation in power system.
9. What are the components of speed governor system of an alternator? Derive a transfer function and sketch a block diagram.
10. Draw and explain the basic P-f and Q-V control loops.
11. Briefly explain about the plant level and the system level controls.
12. Briefly discuss the classification of loads and list out the important characteristics of various types of loads.
13. i) Briefly explain the overview of system operation.
     ii) Explain about the Static characteristics of various loads.
14. What is the function of Load Frequency Control?
15. Explain the Principle of Tie-line Bias control.
16. What is the purpose pf primary ALFC?
17. How is the real power in a power system controlled?
18. What is meant by control area?
19. Define area control error.
20. Write the tie line power deviation equation in terms of frequency?
21. List the advantage of multi area operation.
22. List out the various needs for frequency regulation in power system.
23. What is the purpose of a speed changer?
24. Discuss in detail the dynamic response of a single area system, without integral control, following a step load disturbance.
25. Derive the transfer function of an uncontrolled load frequency control of a single area system and derive the expression for static error following a step load change.
26. Draw the transfer function block diagram for a two area system provided with governor control and obtain the steady state frequency error following a step load change in both the areas.
27. What are the methods of Voltage control?
28. List the various components in AVR loop.

29. Where are synchronous condensers installed?
30. What are the methods of increasing response in AVR?
31. What are the different types of static VAR compensators?
32. Distinguish between on-load and off-load tap changing.
33. Compare series and shunt capacitors
34. How is voltage control obtained by using tap changing transformer?
35. What is booster transformer? Where it is used and also discuss its advantages and disadvantages?
36. What is SVC? Explain briefly with block diagram.
37. Discuss the basic operating principle of STATCOM,
38. Why the FACTS CONTROLLERS are useful for Today's complex power system Network? Justify your answer.
39. What are the various methods for solving state estimation problems. Explain one of them in detail.
40. Give the IEEE definition of SVS and TCSC. Also give the controlling attributes for above.
41. What is the difference between FACTS and FACTS Controllers?
42. Distinguish between linear and nonlinear load with suitable examples.
43. Describe receiving end power circle diagram in detail.
44. Compare series and shunt capacitors when used in a power system network to control voltage.
45. Discuss generation and absorption of Reactive Power.
46. Explain how voltage control can be affected by injection of Reactive Power.
47. Draw the composite SVS power system characteristics.
48. What are the applications of SVS?
49. Explain different types of static VAR compensators with a phasor diagram.
50. What are load curve and load duration curve?
51. What are the needs for load forecasting?
52. What is daily, Weekly, Annual load curve?
53. Define load factor.
54. Define diversity factor.
55. What is demand factor?
56. What is meant by incremental cost curve?
57. Define spinning reserve.
58. What are cold reserves and hot reserves?
59. When do discontinuities occur in the fuel cost curve and the incremental cot curve?
60. What is plant use factor?
61. What is the purpose of economic dispatch?
62. What is meant by unit Commitment?
63. Compare unit commitment and economic dispatch
64. What do you mean by priority list method?

65. What are all the points to be noted for a economic load dispatch including transmission losses?
66. Explain briefly the constraints on unit commitment problem.
67. What is spinning reserve and does this reserve help in operating a power system efficiently?
68. Explain Priority list method using full load average production cost. State the merits and demerits.
69. Explain with a neat flowchart the procedure for finding the solution for unit commitment problems using forward DP method.
70. What are the major functions that are carried out in an operations control center?
71. What are the EMS functions?
72. Define Energy control center.
73. What is contingency analysis program?
74. What is SCADA?
75. What are the functions of SCADA?
76. What are the different operating states of a power system?
77. What is emergency state?
78. Write importance of state estimation in power system.
79. What is security monitoring and control?
80. List the factors that affect the power system security.
81. What are the important types of relays used for protection?
82. What do you understand power system stability?
83. Distinguish between reliability and security of a power system.
84. Explain the different system operating states.
85. Discuss about automatic substation control using SCADA.
86. Explain about SCADA configuration.
87. Briefly discuss the various functions of energy control centre.
88. Explain the hardware components and functional aspects of SCADA system using a fundamental block diagram.
89. Explain the various controls for secure operation.
90. Explain briefly how the system states are continuously monitored and controlled.
91. Discuss in brief about optimal operation of hydro thermal system.
92. A two bus system shown in fig.1. If 100 MW is transmitted from plant 1 to the load, a transmission loss of 100 MW is incurred. Find out the required generation schedule for each plant and load is Rs. 25/MW hr. the incremental production costs of plants are:

$$\frac{dC_1}{dP_{G_1}} = 0.02\ P_{G1} + 16.0$$
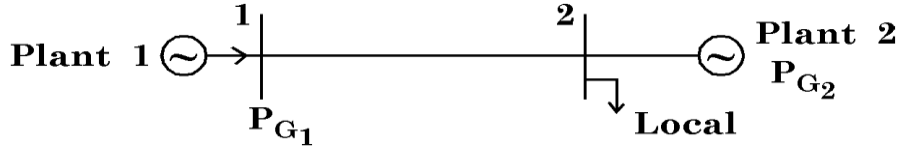
$$dC_2/dP_{G2} = 0.04\ P_{G2} + 20.0$$

Fig. 1

93. A 100 MVA synchronous generator operates on full load at frequency of 50 Hz. The load is suddenly reduced to 50 MW. Due to time lag in governor system, the steam valve begins to close after 0.35 seconds. Determine the change in frequency that occurs in this time. Give H= 5kw-sec/kVA of generator capacity.

94. A 3 phase overhead line has per phase resistance and reactance of 6 ohms and 20 ohms respectively. The sending end voltage is 66 kV while the receiving end voltage is maintained at 66 kV by a synchronous phase modifier. Determine the KVAr of the modifier when the load at receiving end is 75 MW at p.f. 0.8 lagging; Also determine the maximum load that can be transmitted. Give alph = 0 degree, beta = 73.3 degree, A=1, B=20.88 ohm.

95. Explain Structure & Characteristics of TCR with suitable block diagram.

96. Explain Structure & Characteristics of FC-TCR with suitable block diagram.

97. Explain Structure & Characteristics of TSC with suitable block diagram.

98. Explain Structure & Characteristics of TSSC & TCSC with suitable block diagram.

99. Explain Structure & Characteristics of SSSC, TC-PAR with suitable block diagram.

100.   Explain Structure & Characteristics of UPFC with suitable block diagram.