QUESTION BANK

UNIT-1

Short Answer Questions

1. Specify the use of static and dynamic response of ALFC loop?
2. Write the tie line power deviation equations in terms of frequency?
3. State the conditions to be fulfilled when two alternators are in parallel?
4. Define the term control area?
5. What is the function of load frequency control?
6. What is the effect of speed changer on speed governor system?
7. What is meant by fly ball speed governor?

Long Answer Questions

1. Derive the mathematical modeling of speed governor mechanism.
2. Derive the expression for dynamic response of uncontrolled two area system.
3. Develop a linear mathematical model of two area system and also explain the tie line bias control of two area system.
4. With a block diagram, explain the proportional plus integral control of a single area system. Discuss the dynamic response of load frequency controller with and without integral action.
5. Two turbo alternators are rated at 25MW each. They are running in parallel. The speed load characteristics of the driving machines are such that the frequency of alternator 1 drops uniformly from 50 HZ on no load to 48HZ on full load and that of alternator 2 from 50 HZ to 48.5 HZ, How will the two machines share a load of 30MW and bus bar frequency at this load?

6. Draw the speed load characteristics of governing mechanism & explain.
7. Describe the static and dynamic analysis of uncontrolled system.

UNIT-2

Short Answer Questions

1. What are the methods of voltage control?
2. What is the function of exciter?
3. Mention the effect of connecting a static capacitor in series with the line?
4. What is the need for using compensators in power system?
5. What are the types of excitation system?
6. List the various compensating devices?

Long Answer Questions

1. What are different methods of excitation system? Explain any one method.
2. Explain any four methods of voltage control in AVR system?
3. Derive the mathematical model of AVR loop and also explain its static and dynamic response.
4. Discuss the generation and absorption of reactive power?
5. Explain the operation of on-load tap changing transformer for reactive power control; also discuss its merits and demerits.
6. Explain the static shunt capacitor method of voltage control. State it advantages and disadvantages.
7. Explain the different types of compensating equipment's for transmission system?
8. Explain the static shunt reactor method of voltage control. State it advantages and disadvantages.

UNIT-3

Short Answer Questions

1. Write the co-ordination equation with and without losses.
2. What is meant by incremental cost curve?
3. Write the transmission loss formula using Bmn coefficients.
4. State the objective of economic load dispatch.
5. Name the methods of finding economic dispatch?
6. How the economic controller can be added to tertiary loop of LFC control?

Long Answer Questions

1. Explain the co-ordination equation with and without losses?
2. The input and output curve characteristics of three units are
C1=0.00142P12+7.2P1+510 Btu/hr
C2=0.00194P22+7.85P2+310 Btu/hr
C1=0.00482P32+7.97P3+78 Btu/hr
The fuel cost of unit 1 is 1.1 Rs/Mbtu, 1.0Rs/Mbtu for unit 2 and 3. Total load is 850MW. Use the participation factor method to calculate the dispatch for a total load of 900MW.
3. Discuss how to solve the co-ordination equations using Bmn coefficient by iteration method.
4. Explain in detail the combined economic dispatch and load frequency control.
5. A plant has two generators supplying the plant bus and neither is to operate below 20 MW or above
135MW ,Incremental cost with PG1 and PG2 in MW are
df1/dpg1 = 0.14pg1+21 Rs/Mwhr
df2/dpg2 = 0.225pg2+16.5 Rs/Mwhr
For economic dispatch find the plant λ when the demand equals
a) 45 mw
b) 125 mw
c) 250 mw

6. The fuel cost of two units are given by
F1=1.6+25PG1+0.1PG12 Rs/hr
F2=2.1+32PG2+0.1PG22 Rs/hr

If the total demand on the generator is 250MW, find the economic load scheduling of two units.

7.Consider a two bus system , if 50 mw is transmitted from plant 1 to the load , a transmission loss of 10mw is incurred, find the required generation for each plant and power received by the load when the system ʎ is 22/mwhr.The cost function is given by

C1=720+16PG1+0.01PG12

C2=900+20PG2+0.02PG22

UNIT-4

Short Answer Questions

1. Define load curve, and mention it types?
2. What is load duration curve?
3. Define load factor, demand factor, diversity factor?
4. What is unit commitment and List the constraints in unit commitment problem?
5. What is the need for unit commitment problem?
6. Define base load and peak load?
7. State the advantages and disadvantages of priority list method?

Long Answer Questions

1. Discuss about load curve and load duration curve. State the difference between two curves and mention the importance of these curves.

2. Explain the unit commitment by Priority Ordering method.

3. A generating station has the following daily load cycle.

Time(hours)	0-6	6-10	10-12	12-16	16-20	20-24
Load(mw)	20	25	30	25	35	20

Draw the load curve, load duration curve and also find

i) No. Of units generated per day
ii) Maximum demand
iii) Average load
iv) Load factor

4. Draw the flowchart for dynamic programming method and explain it in detail?
5. What is load forecasting? Also state its classification and importance.
6. Explain the forecasting of load by least square method?
7. What is unit commitment? List the constraints in unit commitment in detail.

UNIT-5

Short Answer Questions

1. What are the functions of energy control center? Define SCADA systems, and also mention its functions?
2. Write the operating states of power system?
3. Name the different methods of voltage control and state the importance of voltage control?
4. List the factors that affect power system security?
5. State the difference between PF & QV control loop?
6. What is the objective of power system control?
7. What is the need for voltage regulation in power system?
8. What is spinning reserve?

Long Answer Questions

1. Draw the state Transient diagram. Briefly explain the different system operating states.
2. With a neat sketch describe the significance of P-F and Q-V control structure in power system
3. With a neat sketch describe the operation of SCADA systems.
4. Briefly discuss the various functions of energy control center.
5. Explain the real time control of power system.

ASSIGNMENTS

ASSIGNMENT-1

1. Derive the mathematical modeling of speed governor mechanism.
2. Develop a linear mathematical model of two area system and also explain the tie line bias control of two area system.
3. With a block diagram, explain the proportional plus integral control of a single area system. Discuss the dynamic response of load frequency controller with and without integral action.
4. Two generators rated 200MW and 400MW are operating in parallel.,The drop characteristics of their governors are 4% and 5% respectively from no load to full load. Assuming that the generators are operating at 50 Hz at no load , how would a load of 600MW be shared between them? What will be the system frequency at this load? Assume free governor operation, repeat the operation if both governors have a drop of 4%.
5. What are different methods of excitation system? Explain any one method.
6. Explain any four methods of voltage control in AVR system?
7. Derive the mathematical model of AVR loop and also explain its static and dynamic response.
8. The fuel cost of two units are given by F1=1.6+25PG1+0.1PG1 2 Rs/hrF2=2.1+32PG2+0.1PG2 2 Rs/hr If the total demand on the generator is 250MW, find the economic load scheduling of two units.
9. Explain the co-ordination equation with and without losses?

ASSIGNMENT-2

1. Draw flow chart for economic scheduling without considering line losses.
2. Explain optimal load flow solution without inequality constraints.
3. What is unit commitment and List the constraints in unit commitment problem?
4. State the assumptions made in priority list method?
5. A generating station has the following daily load cycle. Draw the load curve, load duration curve and also find i) No. Of units generated per day ii) Maximum demand iii) Average load iv) Load factor
6. Draw the flowchart for dynamic programming method and explain it in detail?
7. With a neat sketch describe the operation of SCADA systems.
8. Explain the unit commitment by Priority Ordering method
9. Draw the state Transient diagram. Briefly explain the different system operating states.