

**'T' Scheme
Sample Question Paper**

Program Name : Electrical Power System
Program Code : EP
Semester : Sixth
Course Title : Power system operation and Control
Max. Marks : 70

22632

Time: 3 Hrs.

Instructions:

- (1) All questions are compulsory.
- (2) Illustrate your answers with neat sketches wherever necessary.
- (3) Figures to the right indicate full marks.
- (4) Assume suitable data if necessary.
- (5) Star a main question on new page.
- (6) Preferably, write the answers in sequential order.

Q.1 Attempt any Five of the following. (10 Marks)

- a) List out any two causes of real power imbalance in power system.
- b) Suggest type of reactive power compensations equipment for the transmission line of a power system.
- c) Define Load flow studies referred to power system operation.
- d) Interpret the data related to transformer for load flow study of a power system.
- e) Define Stability and Instability of a power system.
- f) Differentiate large disturbance and small disturbance in a power system (any two points).
- g) State the location of Central Load Dispatch Center and its back up center in India.

Q.2 Attempt any Three of the following. (12 Marks)

- a) Explain the effect of the variable frequency at the consumer terminal in the power system.
- b) Draw schematic diagram of Automatic voltage control used for an alternator and label it.
- c) List significant features of the Y_{bus} matrix.
- d) Identify the significance of Load flow analysis for the power system.

Q.3 Attempt any Three of the following. (12 Marks)

- a) Draw the block diagram of Automatic Generation Control (AGC) for the generating system.
- b) Explain the functioning of any four components of turbo-generator speed governing system.
- c) Restate the static load flow equations for a simple two bus system and define its parameters.
- d) Prepare the list of adverse effects of instability of power system at consumer terminals.

Q.4) Attempt any Three of the following. (12 Marks)

- List out the information obtained from Load flow studies.
- Interpret the Characteristics' of the SLFE for simple two bus power system.
- Explain the different stability state condition of the power system
- Describe any four methods of improving Steady state stability condition for the power system.
- Illustrate significance of Load forecasting in power system operation.

Q.5) Attempt any Two of the following. (12 Marks)

- Derive the relation between voltage and reactive power flow in the simple two bus power system.
- Describe the functioning of the Automatic Load Frequency Control using the block diagram for the given type of generator.
- Explain conventional methods of improving Transient State Stability condition for the given power system.

Q.6) Attempt any Two of the following. (12 Marks)

- Explain impact of any six factors on Load shedding in power system operation.
- Describe the functions of Regional Load Dispatch Centre referred to Indian power system scenario.
- Develop bus-admittance matrix for the power system shown in figure 6-c, with the data given below.

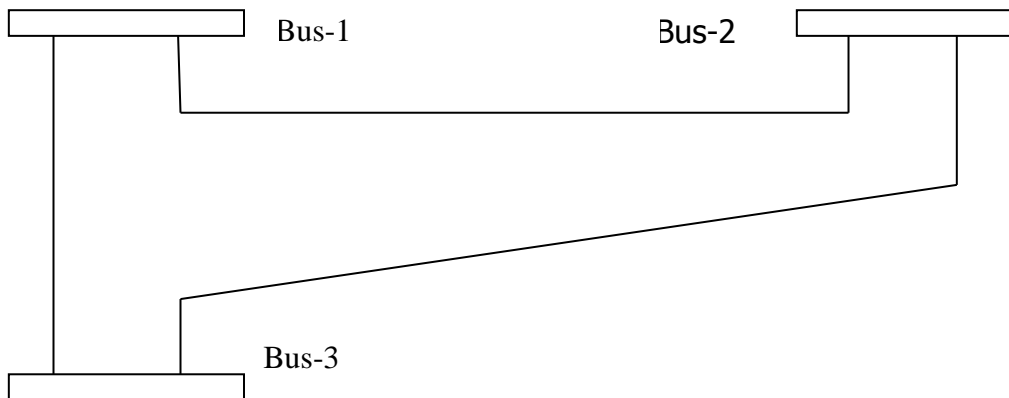


Figure 6-c

Bus code i-k	Line impedance Z_{ik} in p.u	Line charging admittance $Y_{ik}/2$ in p.u
1-2	$0.02 + j0.06$	$j0.03$
1-3	$0.08 + j0.24$	$j0.03$
2-3	$0.06 + j0.18$	$j0.020$

'T' Scheme
Progressive Test– I Sample Question Paper

Program Name : Electrical Power System
Program Code : EP
Semester : Sixth
Course Title : Power system operation and Control
Max. Marks : 20

22632

Time: 1 Hour

Instructions:

- (1) All questions are compulsory.
- (2) Illustrate your answers with neat sketches wherever necessary.
- (3) Assume suitable data if necessary.
- (4) Preferably, write the answers in sequential order.

Q.1 Attempt any FOUR.

(08 Marks)

- a. Explain the significance of the reactive power balance in the power system.
- b. State any two adverse effect of real power imbalance in the power system.
- c. State any two examples for impact of variable frequency supply at consumer terminals.
- d. State the function of speed governor in turbine speed governing system.
- e. State any two advantages of reactive power compensation.
- f. Identify any two significant factors for load flow analysis.

Q.2 Attempt any THREE.

(12 Marks)

- a) Draw schematic diagram of the Automatic Load Frequency Control (ALFC).
 - b) Derive the relation between Real power balance and frequency for the 2-bus system.
 - c) List out the data required for load flow analysis in the power system.
 - d) Explain reactive power compensation in the cases of loads and transmission lines.
 - e) Explain with sketches the application of Load-frequency control for the single area control.
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'T' Scheme
Progressive Test– II Sample Question Paper

Program Name : Electrical Power System
Program Code : EP
Semester : Sixth
Course Title : Power system operation and Control
Max. Marks : 20

22632

Time: 1 Hour

Instructions:

- (1) All questions are compulsory.
- (2) Illustrate your answers with neat sketches wherever necessary.
- (3) Assume suitable data if necessary.
- (4) Preferably, write the answers in sequential order.

Q.1 Attempt any FOUR.

(08 Marks)

- a) Define the terms Load flow studies referred to power system operation.
- b) State the data referred to generator required for Load flow studies.
- c) Define the terms related to power system stability.
 - i. Steady state stability
 - ii. Transient state stability
- d) Give two examples for 'Large disturbance' and 'Small disturbance' referred to power system stability.
- e) State the difference between 'Load forecasting' and 'Load shedding' referred to power system.

Q.2 Attempt any THREE.

(12 Marks)

- a) Interpret any four Characteristics' of SLFE
- b) Explain Steady State Stability condition of the power system with the help of power angle diagram.
- c) Explain two New Techniques of improving Transient State Stability condition.
- d) Explain impact of social factors on the Load forecasting of the given power system.
- e) Draw single line diagram of a power system with the following data. Also draw admittance diagram and calculate self-admittances of Y-bus matrix.

Bus code i-k	Line impedance Z_{ik} in p.u	Line charging admittance $Y_{ik}/2$ in p. u
1-2	$0.09 + j0.34$	$j0.01$
2-3	$0.06 + j0.08$	$j0.02$
1-3	$0.05 + j0.06$	$j0.00$