22632

24225

3 Hours / 70 Marks Seat No. | | | | | | | | |

Instructions : (1) All Questions are *compulsory.*

(2) Answer each next main Question on a new page.

(3) Illustrate your answers with neat sketches wherever necessary.

(4) Assume suitable data, if necessary.

(5) Use of Non-programmable Electronic Pocket Calculator is permissible.

Marks

1. Attempt any FIVE of the following : **10**

(a) Explain the concept of 'real power balance' in power system.

(b) List out the reactive power compensating equipments used for the transmission lines.

(c) State the data related to transmission line required for load flow studies.

(d) State any two significant features of Y_{bus} matrix.

(e) Define 'Stability' and 'Overall stability' of a power system.

(f) State two examples for 'Large disturbance' and for 'Small disturbance' in a power system.

(g) State the locations of 5 RLDC in India.

2. Attempt any THREE of the following : **12**

(a) Explain the effect of change in voltage on consumers and power supply agencies.

(b) Draw a neat labelled schematic diagram of Automatic Load Frequency Control.

(c) Write static load flow equation for a two-bus system and define its parameters.

(d) List out the information obtained from load flow studies.

3. Attempt any THREE of the following : **12**

(a) Explain the process of Automatic voltage control of alternator with the help of diagram.

(b) State the functions of following components of Turbine speed governing system :

– Hydraulic amplifier

– Linkage mechanism

– Speed changer

– Fly ball speed governor

(c) Determine the self-admittances and mutual admittances of a Y_{bus} matrix of a power system with the following data. Also write Y_{bus} matrix.

Bus code i-k	**Line Impedance Z_{ik} in Ω**	**Line charging admittance Y_{ii}**
1 – 2	0.02 + j0.06	j0.03 *v*
1 – 3	0.08 + j0.04	j0.025 *v*
2 – 3	0.06 + j0.18	j0.020 *v*

(d) List out any four methods of improving steady state stability condition.

4. Attempt any THREE of the following : **12**

(a) Develop $I_{bus} - Y_{bus} V_{bus}$ for a simple two bus system model.

(b) List out the advantages of Y_{bus} matrix in load flow studies.

(c) Define the following terms related to power system stability :

- Steady state stability
- Steady state stability limit
- Transient state stability
- Dynamic stability

(d) Explain the adverse effects of instability of a power system.

(e) State the significance of load forecasting for Power System Operation and Control.

5. Attempt any TWO of the following : **12**

(a) Derive the relation between reactive power flow and voltage level of the system.

(b) Draw the schematic diagram of Automatic Generation control system used for an alternator.

(c) Explain the idea of load dispatch in the power system.

6. Attempt any TWO of the following : **12**

(a) Explain the stepwise procedure to develop Y_{bus} matrix for a 3-bus system.

(b) State and explain any six methods of improving Transient state stability condition of a power system.

(c) Define load shedding and list out the factors that govern load shedding.
