23124

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)   Figures to the right indicate full marks.

(5)   Assume suitable data, if necessary.

Marks

1.   **Attempt any FIVE :**   **10**

(a)   State any two adverse impacts of frequency variation on supply agencies.

(b)   Suggest type of reactive power compensations equipments for the transmission line of a power system.

(c)   Define load flow studies referred to power system operation.

(d)   State the data required for load flow studies.

(e)   Define steady state stability & transient state stability.

(f)   Differentiate large disturbance and small disturbance in power system. (any two points)

(g)   State the location of central load dispatch centre and its backup center in India.

2. **Attempt any THREE :** **12**

    (a)   Explain the effect of change in voltage on consumer side.

    (b)   Draw schematic diagram of turbine speed governing system and label it.

    (c)   State the characteristics of Y_{Bus} matrix.

    (d)   Write SLFE of a simple two bus power system and define its parameters.

3. **Attempt any THREE :** **12**

    (a)   State the functions of following systems referred to AGC & ALFC :

        (i)   Hydraulic amplifier

        (ii)   Frequency integrator

        (iii) Governor

        (iv) Comparator

    (b)   Draw the block diagram of Automatic voltage control and label it.

    (c)   Identify the significance of Load Flow Analysis for the power system.

    (d)   Prepare the list of adverse effects of instability of power system at consumer terminals.

4. **Attempt any THREE :** **12**

    (a)   State the importance of 'bus' in power system.

    (b)   List the data required for load flow studies with reference to transformers & transmission lines.

    (c)   Draw and explain power angle diagram neglecting losses in the system.

    (d)   Write 'Swing Equation' referred to power system and define it's parameters.

    (e)   Illustrate significance of load forecasting in power system operation.

5. Attempt any TWO : 12

(a) Derive the relation between voltage and reactive power flow in the simple two bus power system.

(b) Describe the functioning of the Automatic Load Frequency Control using block diagram for the given type of generator.

(c) List out traditional and new methods of improving transient stability in a power system. Also explain any one traditional technique among them.

6. Attempt any TWO : 12

(a) Enlist any six factors which govern the load shedding in power system.

(b) Describe the functions of state load dispatch centre & regional load dispatch centre referred to Indian power system scenario.

(c) Develop Y_{Bus} matrix for a 3 bus system with the following details :

Bus Code	Line Impedance (Pu)	Bus code	Line Charging admittance (Pu)
1-2	0.08 + j 0.32	1	j 0.02
2-3	0.06 + j 0.82	2	j 0.01
1-3	0.05 + j 0.06	3	j 0.03

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