Sample Test Paper-I

Course Name : Diploma in Electrical Power System

Course Code : EP

Semester   : Sixth

17643

Subject Title : Power System Operation & Control

Marks   : 25   **Time:1 Hour**

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. Preferably, write the answers in sequential order.

**Q1. Attempt any THREE**   **9 Marks**

   a) Classify the buses used in power system.

   b) State the need of load flow analysis.

   c) Describe the concept of load compensation.

   d) List any three advantages of shunt compensation.

Q2. Attempt any TWO   **8 Marks**

   a) Derive the relation between real power and frequency for a simple two bus system.

   b) Describe synchronous compensation method used for reactive power compensation.

   c) State the information obtained from load flow analysis.

Q3. Attempt any TWO   **8 Marks**

   a) State why utilities have to maintain constant supply frequency.

   b) Write the SLFE equations for two bus system.

   c) Derive Y bus for following system.
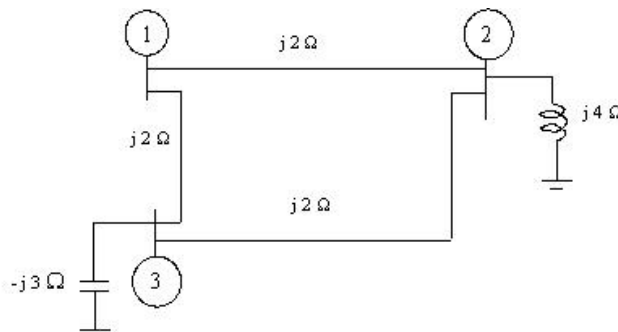
Scheme –   **G**

Sample Test Paper-II

Course Name : Diploma in Electrical Power System

Course Code : EP

Semester : Sixth

17643

Subject Title : Power System Operation & Control

Marks : 25

Time:1 Hour

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. Preferably, write the answers in sequential order.

Q1. Attempt any THREE **9 Marks**

a) Define Power system stability and instability.

b) State the factors affecting transient stability.

c) List the methods of voltage control.

d) State the need of load forecasting.

Q2. Attempt any TWO **8 Marks**

a) Describe steady state stability with the help of power angle curve.

b) Draw neat labeled diagram of turbine speed governing system.

c) Describe environmental effects in load forecasting.

Q3. Attempt any TWO **8 Marks**

a) List the methods of improving transient stability.

b) Describe automatic voltage control with neat diagram.

c) Describe the concept of economic load dispatch and optimum dispatch.

Sample Question Paper

Course Name : Diploma in Electrical Power System

Course Code : EP

Semester   : Sixth

17643

Subject Title : Power System Operation & Control

Marks   : 100   **Time: 3 Hours**

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. Preferably, write the answers in sequential order.

Q1. (A) Attempt any THREE of the following.   **12 Marks**

   a)   State the significance of bus in power system.
   b)   List the data required for load flow analysis.
   c)   State the need of load flow analysis.
   d)   Define Steady state limit and transient stability limit.

Q1. (B) Attempt any ONE of the following.   **06 Marks**

   a)   Derive the relation between real power and frequency for simple two bus system.
   b)   Describe load frequency control using single area case with the help of block diagram.

Q2. Attempt any FOUR of the following.   **16 Marks**

   a)   State the effect of change supply frequency on consumers.
   b)   Write the SLFE equations for two bus system.
   c)   Describe the concept of steady state stability and transient stability.
   d)   Describe power system stability with the help of simple two machine model.
   e)   State the concept of automatic voltage control.
   f)   State the types of load dispatch center.

Q3. Attempt any FOUR of the following.   **16 Marks**

   a)   "Supply authorities have to maintain constant supply frequency" Justify the statement.
   b)   Describe the steps involved in deriving SLFE for a two bus system.
   c)   Describe Bus loading and line flow equations for formation of Y bus.
   d)   State the adverse effects of power system instability.

e) Develop a Y bus matrix for the following given 3 bus system

Bus Code	Line Impedance (p.u.)	Bus Code	Line charging admittance (p.u.)
1-2	0.09 + j0.32	1	j0.01
2-3	0.04 + j0.062	2	j0.03
1-3	0.051 + j0.08	3	J0.02

Q4. (A) Attempt any THREE of the following. 12 Marks

    a) Distinguish between shunt compensation and synchronous compensation.

    b) Write the swing equation and state meaning of each term in it.

    c) Derive SLFE for two bus system.

    d) State the factors governing load shedding.

Q4. (B) Attempt any ONE of the following. 06 Marks

    a) Describe the necessity of reactive power compensation. List the methods of compensation.

    b) Describe operation of turbine speed governing system with the help of block diagram.

Q5. Attempt any FOUR of the following. 16 Marks

    a) List the information obtained from load flow analysis.

    b) State the concept of dynamic stability.

    c) List the methods of voltage control.

    d) Describe the automatic load frequency and voltage regulator control loops of a synchronous generator.

    e) List the functions of national load dispatch centre.

    f) Describe different planning tools used for load forecasting.

Q6. Attempt any FOUR of the following. 16 Marks

    a) Describe economic load dispatch with the help of incremental fuel cost curve.

    b) Derive the maximum power limit under steady state stability condition.

    c) Describe the reactive power injection method used for voltage control with neat diagram.

    d) "Social factors are important in load forecasting" Justify the statement.

    e) The cost curve of two generating units of a power plant are given as

       $dC_1/ dP_1 = 0.4 P_1 + 40$ ₹/ Mwh

       $dC_2/ dP_2 = 0.5 P_2 + 30$ ₹/ Mwh

       Determine fuel cost of each unit for total load on station to be 500MW considering economic load dispatch.