17643

21415

3 Hours / 100 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. [A] Attempt any THREE of the following : **12**

(a) Define Bus. Explain the classification of bus.

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

(c) With diagram derive the line flow equation for 2-bus system.

(d) Define (i) Power system stability (ii) Power system instability.

[B] Attempt any ONE of the following : **6**

(a) Explain the concept of load compensation and line compensation.

(b) Explain how voltage control can be done by (i) Reactive power injection (ii) Transformers.

2. Attempt any FOUR of the following : **16**

(a) State the effect of change in voltage level on consumers.

(b) Write the S.L.F.E. for two bus system.

(c) With the help of a model, explain the stability studies for simple two machine model.

(d) State the significance of power angle curve with the help of diagram.

(e) Explain the turbine speed governing system with the help of diagram.

(f) Explain the procedure of load forecasting by load curve.

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3. Attempt any FOUR of the following : **16**

(a) State the advantages of synchronous compensation over static compensation.

(b) State the information obtained from load flow studies.

(c) State the need of load flow analysis in power system.

(d) Define : (i) Transient stability & state its limits.

(ii) Steady state stability and its limits.

(e) Fig. (a) shows a 4-bus system. Treat the bus 4 as reference bus. Find the bus admittance matrix. P.U. reactances are shown in fig.

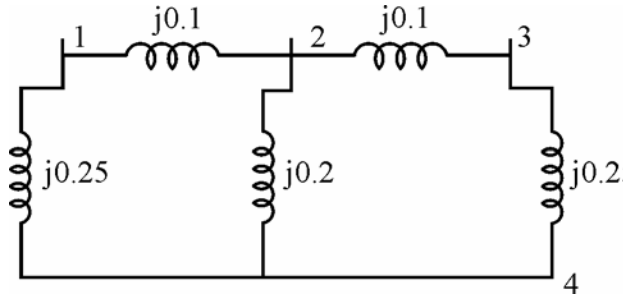

Fig.-(a)

4. [A] Attempt any THREE of the following : **12**

(a) Compare shunt compensation to series compensation.

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

(c) Derive the SLFE in general form.

(d) Define the load shedding and state its governing factor.

[B] Attempt any ONE of the following : **6**

(a) Discuss the relationship between real power and frequency for a simple two bus.

(b) Draw the diagram of automatic voltage control and explain each block in it.

5. Attempt any FOUR of the following : **16**

(a) Describe the steps involved in deriving SLFE for a two bus system.

(b) Define : (i) Dynamic state stability (ii) Overall stability.

(c) Draw the diagram of automatic load frequency and voltage regulator control system.

(d) List the methods of voltage control.

(e) State the environmental and social factors in load forecasting.

(f) Describe the concept of economic load dispatch and optimum load dispatch.

6. Attempt any FOUR of the following : **16**

(a) Explain the need of forecasting in power system.

(b) Derive the equation of maximum power flow under steady state condition.

(c) State the different methods of voltage control by Reactive power injection. Explain any one.

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

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

$dc_1/dp_1 = 0.3p_1 + ₹ 50 / MWh$

$dc_2/dp_2 = 0.4p_1 + ₹ 40 / MWh$

Determine fuel cost of each unit for total load on station to be 1000 MW considering economic load dispatch.

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