CBCS SCHEME

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18EE81

Eighth Semester B.E. Degree Examination, Dec.2023/Jan.2024
Power System Operation and Control

Time: 3 hrs. Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

1 a. Explain the operating states of power system. **(10 Marks)**

b. Explain energy management center along with major components of energy centres. **(10 Marks)**

OR

2 a. Explain the function of SCADA with block diagram. **(10 Marks)**

b. Give a brief explanation on classification of SCADA system. **(10 Marks)**

Module-2

3 a. Explain the speed governor system. **(10 Marks)**

b. Give the mathematical model of single area controlled ALFC along with block diagram. **(10 Marks)**

OR

4 a. Explain the steady static analysis of ALFC. **(10 Marks)**

b. A 100MVA synchronous generator operates on full load at frequency of 50Hz. The load is suddenly reduced to 50MW. Due to time lag in governor system, the steam valve begins to close after 0.4 seconds.
Determine the change in frequency that occurs in this time. Given H = 5kW – sec/KVA of generator capacity. **(10 Marks)**

Module-3

5 a. Explain two area load frequency control. **(10 Marks)**

b. Derive the state space model for a single area LFC system. **(10 Marks)**

OR

6 a. Explain automatic voltage control with block diagram. **(10 Marks)**

b. Explain speed governor dead band and its effect on AGC. **(10 Marks)**

Module-4

7 a. Explain the production and absorption of reactive power. **(10 Marks)**

b. Express the relation between voltage and reactive power. **(10 Marks)**

OR

8 a. Consider the transmission system shown in Fig.Q.8(a). The PU values are referred to the respective voltage bases and 100MVA base. Determine the power supplied by the generator and its p.f.

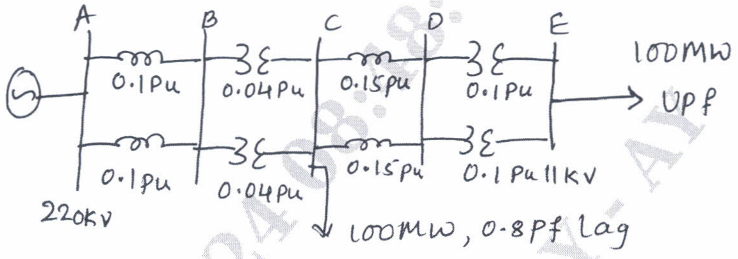

Fig.Q.8(a)

(10 Marks)

b. Explain tap changing transformer for voltage control. (10 Marks)

Module-5

9 a. Explain the major function of power system security. (10 Marks)

b. Explain contingency analysis by sensitivity factor. (10 Marks)

OR

10 a. Explain the process of contingency selection and contingency ranking. (10 Marks)

b. Explain linear least square estimation. (10 Marks)

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