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Paper ID: | | | | | **Roll No.** | | | | | | | | | | |

B Tech
(SEM. VII) THEORY EXAMINATION 2017-18
POWER SYSTEM OPERATION AND CONTROL

Time: 3Hours ***Max. Marks: 100***

Note: Attempt all Sections. Assume missing data, if any.

SECTION –A

1. Attempt all question in brief: **10 x 2=20**

a) What do you understand by the term "state estimation"?
b) What do you mean by pool operation?
c) Draw the structure of power system.
d) What do you understand by voltage collapse?
e) Draw the characteristics of input output for the thermal and hydro plant
f) What do you understand by system constraints & is unit commitment?
g) Explain the concept of load frequency control.
h) Explain the basic role of ALFC.
i) What is an EXCITER and FACTS controller?
j) Write any five methods of voltage control?

SECTION –B

2. Attempt any **three** parts of the following : **10x3=30**

a) What do you mean by "SCADA" system? Discuss the" SCADA" system, with the help of block diagram. Also mention its advantage and disadvantage.
b) What do you understand by PENALTY FACTOR METHODS in economic dispatch? What are the advantage and disadvantage of PENALTY FACTOR METHODS? Also mention its importance in optimal power from load dispatch in power system environment.
c) Explain the use of proportion integral controller in load frequency control with Mathematical Model.
d) Explain UPFC with characteristics, operating principle and neat diagram.
e) For a power system having two generating stations the B-coefficients areB_{11}=0.001 MW^{-1}, B_{12} = - 0.0005 MW^{-1} and B_{22} = 0.0024 MW^{-1} and the incremental costs of the two stations are:

$dC_1/dP_1 = 0.08P_1 + 16$ Rs/MW-hr
$dC_2/dP_2 = 0.08P_2 + 12$ Rs/MW-hr

Calculate economic outputs of the generating stations P_1 and P_2 for $\lambda = 20$. Also calculate the Transmission Losses and the load demand for this value of λ.

SECTION –C

3. Attempt any **one** parts of the following: **10x1=10**

a) How is generation scheduled among various generators when the losses are included?
b) With a labeled diagram explain the speed governing system of turbine.

4. Attempt any **one** parts of the following: **10x1=10**

a) How many types of excitation systems are there? Explain any two excitation system in details.
b) What is the role of AVR? Discuss AVR with diagram?

5. Attempt any **one** parts of the following: **10x1=10**

a) Explain tie line modeling considering two area system. Derive the final expression for the power flow.
b) Give the dynamic response of two area system.

6. Attempt any **one** parts of the following: **10x1=10**

a) What is state estimation? What is the significance of it in power system?
b) Define the following
    1. SVC
    2. UPFC

7. Attempt any **one** parts of the following: **10x1=10**

a) Draw and explain the block diagram of load frequency control of single area system. Also determine the steady state and dynamic response of single area system.
b) What do you mean by “load frequency control” in power system environments? Also mention its merit demerits. Develop the mathematical model of Turbine speed governing system.