

AQ – 2735

Second Semester M. E. Electrical (E.P.S.) Examination
POWER SYSTEM MODELLING AND CONTROL

2 SEPS 3

P. Pages : 2

Time : Three Hours]

[Max. Marks : 80

- Note :** (1) Separate answer book must be used for each section in the subject Geology, Engineering material of civil branch and Separate answer book must be used for Section A and B in Pharmacy and Cosmetic Tech.
- (2) All question carry equal marks.
- (3) Answer **Two** questions from Section A and **Two** questions from Section B.
- (4) Due credit will be given to neatness and adequate dimensions.
- (5) Assume suitable data wherever necessary.
- (6) Diagrams and equations should be given wherever necessary.
- (7) Illustrate your answer wherever necessary with the help of neat sketches.
- (8) Use pen of Blue/Black ink/refill only for writing the answer book.

SECTION A

1. (a) Explain the effect of excitation on dynamic stability and hence examine dynamic stability by Routh's criteria. 10
 (b) Explain the Turbine generator Dynamic model of synchronous machine. 10
2. (a) Derive and explain the mathematical model of turbine speed governing system. 10
 (b) Describe the function of power system stabilizers. 10
3. How does the power vary with time when a system operating at the stability limit falls out of synchronism ? Describe the same for an unstable system and for a system, where the generating station is completely disconnected from the receiving system due to three phase short circuit near the station terminals, Explain. 20

SECTION B

4. (a) With suitable diagram explain three levels of control of SCADA system. What is RTU ? state the functions of RTU. 10

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- (b) Explain the self excited electro-mechanical oscillations in power system and the means of control. 10
5. (a) State the time error and inadvertent interchange correction technique. 10
- (b) A system has two similar areas of equal capacity 4000 MW. $R = 2\text{Hz/Pu MW}$ and $H = 5$ seconds. The tie line has a capacity of 600 MW and is operating at a power angle of 40° . Find (a) The frequency of oscillation of the system. (b) Steady state change in tie line power if a step change of 100 MW load occurs in area B (c) Frequency of oscillation of the system if speed governor loop is open. The system frequency is 50 Hz. 10
6. (a) Explain the following terms in detail :—
- (i) Optimal, sub optimal and 7
- (ii) Decentralized controller. 7
- (b) Describe the mode AGC. 6
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