Register No.: ………………………………   Name: …………………………………………………………..

SAINTGITS COLLEGE OF ENGINEERING (AUTONOMOUS)

(AFFILIATED TO APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY, THIRUVANANTHAPURAM)

SECOND SEMESTER M. TECH DEGREE EXAMINATION (Regular), JULY 2022
POWER SYSTEMS
(2021 Scheme)

Course Code: 21PS201

Course Name: **Power System Control and Security**

Max. Marks: **60**   **Duration: 3 Hours**

PART A
(Answer all questions. Each question carries 3 marks)

1. Derive the transfer function relating speed and power in a fundamental speed governing system.
2. Discuss the factors to be considered in AGC systems with renewable energy resources.
3. Discuss the applications of tap changing transformer in a transmission network with the help of single line diagram.
4. Explain the switching operation of Thyristor Switched Capacitor as a reactive compensator.
5. Outline three major functions to be carried out for ensuring power system security.
6. Explain the factors affecting power system security.
7. Discuss the necessity of state estimation in power systems.
8. What is the significance of Probability Density Function in power system studies?

PART B
(Answer one full question from each module, each question carries 6 marks)

MODULE I

9. Analyze the frequency and power deviations of an interconnected power system with primary speed control.   (6)

OR

10. a) Discuss the working of governor for speed regulation.   (3)

     b) How load sharing among parallel units is facilitated by the governor with speed droop characteristics.   (3)

MODULE II

11. Build an AGC model accounting power fluctuation due to renewable energy sources.   (6)

OR

12. Categorize the key issues and new perspectives for the integration of renewable energy resources in an existing grid.   (6)

MODULE III

13. Explain the working of thyristor-controlled reactor as a phase controller. (6)

OR

14. Discuss any three methods of voltage control with its applications in power system. (6)

MODULE IV

15. Explain the modelling of transformer ULTC control system with necessary block diagram. (6)

OR

16. From the fundamental characteristics of SVS and power system, obtain the feasible operating point during voltage fluctuations, considering the composite SVS - power system characteristics. (6)

MODULE V

17. Discuss the four operating states of power system and their interconnections. (6)

OR

18. Explain with a flow chart contingency analysis using sensitivity factors. (6)

MODULE VI

19. Analyze the principle of maximum likelihood estimation with the help of an example. (6)

OR

20. Analyze how bad measurements are detected and identified in power system (6)

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