**14EE702**

**Hall Ticket Number:**

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| **IV/IV B.Tech (Regular/Supplementary) DEGREE EXAMINATION** | | | |
| **January, 2021** | **Electrical and Electronics Engineering** | | |
| **Seventh Semester** | **Power System Operation Control & Stability** | | |
| **Time:** Three Hours | | **Maximum :** 60 Marks | |
| *Answer ALL Questions from PART-A.* | | | (1X12 = 12 Marks) |
| *Answer* ***ANY FOUR*** *questions from PART-B.* | | | (4X12=48 Marks) |
| **Part - A** | | | |

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| 1 | Answer all questions | | (1X12=12 Marks) | |
|  | a) | Define current distribution factor | |  |
|  | b) | What is incremental fuel cost and what are its units? | |  |
|  | c) | Draw heat rate curve. | |  |
|  | d) | What is the function of speed governor? | |  |
|  | e) | What is single area? | |  |
|  | f) | What do you mean by load frequency control? | |  |
|  | g) | What is shunt compensation? | |  |
|  | h) | Specify any two equipment used to control the voltage. | |  |
|  | i) | What is booster transformer? | |  |
|  | j) | Write swing equation. | |  |
|  | k) | Define voltage stability. | |  |
|  | l) | Define critical clearing time. | |  |
| **Part - B** | | | | |
| 2 | a) | Obtain the condition for optimum operation of a power system with ‘n’ plants when losses are considered. | | 6M |
|  | b) | A plant consists of two units. The incremental fuel characteristics for the two units are given as Rs./MWh  Rs./MWh  Find the optimal load sharing of two units when a total load of 150 MW is connected to the system. | | 6M |
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| 3 | a) | Derive the transmission loss formula and state the assumptions made in it. | | 6M |
|  | b) | Explain the incremental fuel cost curve and incremental production cost curve. | | 6M |
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| 4 | a) | Explain the P-f and Q-V control loops of power system. | | 6M |
|  | b) | Two generators rated 100 MW and 200 MW are operating in parallel with a droop characteristics of 6% from no load to full load. Determine the load shared by each generator if a load of 270MW is connected across the parallel combination of the generations. Assume free governor operation and calculate the change in frequency. | | 6M |
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| 5 | a) | Draw the schematic diagram of a speed governing system and explain its components. | | 6M |
|  | b) | Discuss the dynamic response of single area load frequency control. | | 6M |
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| 6 | a) | What are various types of FACTS devices? Explain about STATCOM with neat sketch. | | 6M |
|  | b) | Explain induction regulators and static capacitors | | 6M |
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| 7 | a) | Explain the different methods of voltage control with neat sketches. | | 6M |
|  | b) | Compare shunt and series compensation. | | 6M |
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| 8 | a) | Explain equal area criteria and derive the expression for critical clearing time. | | 6M |
|  | b) | Discuss the step by step solution of swing curve | | 6M |
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| 9 | a) | Explain the factors affecting the steady state and transient stabilities. | | 6M |
|  | b) | Discuss the comparison between rotor angle and voltage stability in a system | | 6M |

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