

GUJARAT TECHNOLOGICAL UNIVERSITY**BE- SEMESTER-VII (NEW) EXAMINATION – WINTER 2024****Subject Code:3170919****Date:16-12-2024****Subject Name: Power System Operation and Control****Time:10:30 AM TO 01:00 PM****Total Marks:70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

MARKS

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|------------|---|-----------|
| Q.1 | (a) Draw and explain typical structure of deregulated power industry. | 03 |
| | (b) Which are the major provisions of Electricity Act 2003? | 04 |
| | (c) Which are the major issues of Indian power sector? What are the remedies. | 07 |
| Q.2 | | |
| | (a) Explain principle of frequency control in power system. | 03 |
| | (b) Draw and explain block diagram of AGC (Automatic Generation Control). | 04 |
| | (c) Explain Turbine Speed Governing mechanism with suitable diagram. | 07 |
| OR | | |
| | (c) What are the advantages of Deregulated Power Industry compared to Vertically Integrated Power Industry? | 07 |
| Q.3 | | |
| | (a) Explain use of Off load and On load tap changer for voltage control. | 03 |
| | (b) What are drawbacks of series capacitor used for voltage control. | 04 |
| | (c) Explain use of various FACTS devices used for voltage control-TSC, TCR,FC-TCR. | 07 |
| OR | | |
| Q.3 | (a) What is state estimation? | 03 |
| | (b) Explain application of state estimation with block diagram? | 04 |
| | (c) Explain Least Square Estimation for State Estimation. | 07 |
| Q.4 | | |
| | (a) What is load forecasting?What are the objectives of load forecasting? | 03 |
| | (b) What is load survey explain in brief. | 04 |
| | (c) Explain regression analysis method of load forecasting. | 07 |
| OR | | |
| Q.4 | (a) What is contingency analysis? | 03 |
| | (b) Describe various operating states of power system w.r.t power system security? | 04 |
| | (c) Explain Generation Shift Factor and Line Outage Distribution Factor in relation to security analysis? How they are useful in security analysis? | 07 |
| Q.5 | | |
| | (a) What are the uses of long term load forecasting. | 03 |
| | (b) Explain effect of Temperature Humidity Index and Wind Chill Index on load on power system load. | 04 |
| | (c) Explain weighed Least Square Estimation method of power system state estimation. | 07 |
| OR | | |
| Q.5 | (a) Define voltage regulation of transmission line? Why it is important parameter? | 03 |
| | (b) Explain P-V curves of transmission line with different power factors. | 04 |
| | (c) Write short note on Treatment on Bad Data in State Estimation. | 07 |
