

GUJARAT TECHNOLOGICAL UNIVERSITY**BE- SEMESTER-IV (NEW) EXAMINATION – WINTER 2024****Subject Code:3142404****Date:21-11-2024****Subject Name: Basic Power System Engineering****Time:02:30 PM TO 05:00 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) What are the sources of electrical energy? | 03 |
| | (b) Short note: Transformers | 04 |
| | (c) Explain classification of substations. | 07 |
| Q.2 | (a) What is meant by skin effect? | 03 |
| | (b) Explain Conductors and its characteristics. | 04 |
| | (c) Explain inductance of a Conductor due to Internal Flux. | 07 |
| | OR | |
| | (c) Explain concept of grid with types and importance. | 07 |
| Q.3 | (a) Discuss advantages of bundled conductors. | 03 |
| | (b) Short note: Pin Type insulator. | 04 |
| | (c) What is Ferranti effect? Discuss disadvantages of Ferranti effect? | 07 |
| | OR | |
| Q.3 | (a) What is meant by proximity effect? | 03 |
| | (b) What are the common types of Power Reactors? | 04 |
| | (c) What do you understand by transposition of transmission line? what are its effect on the performance of the line? | 07 |
| Q.4 | (a) What are the sources of energy for generation of electricity? | 03 |
| | (b) What are causes of low power factor? | 04 |
| | (c) Advantages and disadvantages of Hydro-Electric power plants. | 07 |
| | OR | |
| Q.4 | (a) Explain need and types of Reactors. | 03 |
| | (b) What are the advantages of phase advancer? | 04 |
| | (c) What are the methods of power factor improvement? explain any one in brief. | 07 |
| Q.5 | (a) Explain Concept of power system stability. | 03 |
| | (b) Explain Layout of substation. | 04 |
| | (c) A consumer has a constant load of 2000kW as a power factor of 0.8 lagging. The tariff is Rs. 900 per KVA of maximum demand plus 90 P per KWH. if the power factor is improved to 0.96 lagging by installing power factor correction equipment calculate the annual saving. The cost of the power factor correction equipment is RS. 1950 PER KVAR and the annual interest and depreciation is 15 %. | 07 |
| | OR | |
| Q.5 | (a) Disadvantages of Low Power Factor. | 03 |
| | (b) What is Earthing? Explain with the types | 04 |
| | (c) Explain selection of site for steam power plant. | 07 |
