

Seat No.: \_\_\_\_\_

Enrolment No. \_\_\_\_\_

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**BE - SEMESTER-IV EXAMINATION – WINTER 2015**

**Subject Code: 140902**

**Date: 30/12/2015**

**Subject Name: Electrical Power**

**Time: 02:30pm to 05:00pm**

**Total Marks: 70**

**Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

**Q.1 (a)** Why transposition is required? Derive an expression for the inductance per phase for a 3-phase overhead transmission line when conductors are unsymmetrical placed but the line is completely transposed. **07**

**(b)** Fill in the blanks **07**

1. The..... distribution is done by 3-phase, 4-wire a.c. system.
2. The most commonly used material for insulators of overhead lines is.....
3. Distribution transformer links the ..... and..... systems
4. A distributor is designed from ..... considerations.
5. Transposition of a 3-phase transmission line helps in.....
6. If the supply frequency increases, then skin effect is.....
7. A metallic sheath is provided over the insulation to protect the cable from..... .

**Q.2 (a)** Two conductors of a single phase line, each of 1 cm diameters, are arranged in a vertical plane with one conductor mounted 1 m above the other. A second identical line is mounted at the same height as the first and spaced horizontally 0.25 m apart from it. The two upper and the two lower conductors are connected in parallel. Determine the inductance per km of the resulting double circuit line. **07**

**(b)** What is string efficiency? Explain the methods of improving string efficiency. **07**

**OR**

**(b)** Explain in brief: (i) Surge Tank (ii) Super Heater (iii) Economizer (iv) penstock **07**

**Q.3 (a)** Draw and label the schematic arrangement of a Thermal power station. **07**

**(b)** Explain general construction of cable with neat diagram. **07**

**OR**

- Q.3** (a) Compare overhead transmission system with underground transmission system. **07**  
(b) Explain (i) Voltage transformer earthing and (ii) Earthing transformer. **07**
- Q.4** (a) Explain function of the major equipments installed in the substation. **07**  
(b) Discuss methods of improving power factor. **07**

**OR**

- Q.4** (a) Explain function of various equipments used in substation. **07**  
(b) With the help of neat diagrams explain the relative advantages and disadvantages of Radial, Ring Main and Interconnected Grid systems of distribution. **07**
- Q.5** (a) Describe with the help of a neat sketch, the working of solar power plant. **07**  
(b) Explain with diagram (i) Pin type and (ii) Suspension type of insulators. **07**

**OR**

- Q.5** (a) With a schematic diagram explain function of main components of Gas Turbine Power plant. **07**  
(b) Discuss advantages and disadvantages of Nuclear power stations **07**

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