

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-IV • EXAMINATION – WINTER • 2014****Subject Code: 140902****Date: 29-12-2014****Subject Name: Electrical Power****Time: 02:30 pm - 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.

- Q.1** (a) Explain with diagram elements of hydro-electric power plant. **08**
(b) Explain in brief: (i) Economizer. (ii) Super Heater (iii) ESP **06**
- Q.2** (a) Write a short note on Nuclear Reactors. **07**
(b) Describe with the help of a neat sketch the working of solar power plant. What are its salient features? **07**
- OR**
- (b) Draw the layout and explain how electrical power is generated in a Combined Cycle Power Plant. **07**
- Q.3** (a) Derive the equation for inductance of three phase transmission line with unsymmetrical spacing. Assume transposition. **07**
(b) A single phase transmission line has two parallel conductors 3 m apart, the radius of each conductor being 1 cm. calculate the loop inductance per km length of the line if the material of the conductor is i) copper ii) steel with relative permeability of 100. **07**
- OR**
- Q.3** (a) Derive expression for capacitance of single phase transmission line taking into account the effect of earth. **07**
(b) Discuss the various conductor materials used for overhead lines. What are their relative advantages and disadvantages? **07**
- Q.4** (a) Explain different types of distribution system with diagram. **07**
(b) What is string efficiency? Explain various methods of improving string efficiency **07**
- OR**
- Q.4** (a) Classify the underground cables according to insulation used, voltage rating and number of cores. Sketch a typical 3 – core cable and label the important parts. **07**
(b) Each conductor of a 3 phase high voltage transmission line is suspended by a string of 4 suspension type disc insulator. If the potential difference across the second unit from top is 13.2 kV and across the third from top is 18 kV, determine the voltage between conductors. **07**
- Q.5** (a) What are disadvantages of low power factor? Explain methods of improving power factor. **07**
(b) Explain following methods of earthing with diagram. **07**
(i) arc suppression coil earthing
(ii) voltage transformer earthing
- OR**
- Q.5** (a) Explain function of various equipments used in substation. **07**
(b) Draw a neat layout of a 132/33 KV substation having two 132 KV incoming line & four 33 KV out going lines. Show essential equipments in the diagram **07**
