

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VIII (OLD) - EXAMINATION – SUMMER 2017****Subject Code:180903****Date:02/05/2017****Subject Name: Power System Practice and Design****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.

- Q.1** (a) Explain classification of lamp-flicker and remedies for reducing lamp-flicker. **07**
 (b) Explain applications of HVDC system. **07**
- Q.2** (a) Explain methods of reducing tower footing resistance. **07**
 (b) The cost of a 3-phase overhead transmission line is Rs. ($25000a + 2500$) per KM where 'a' is the area of cross-section of each conductor in cm^2 . The line is supplying a load of 5 MW at 33 KV and 0.8 p.f. lagging assumed to be constant throughout the year. Energy costs 4 paise per Kwh. Interest and depreciation is 10 % per annum. Find the most economical size of conductor. Give that specific resistance of conductor. Given that specific resistance of conductor material is 10^{-6} ohm cm. **07**
- OR**
- (b) A 2 wire d.c. distributor AB is 200 m long. The resistance of each conductor is 0.4 Ohm per KM. It supplies loads of 20 A, 35 A, 25 A and 30 A at points C, D, E and F situated at 50, 80, 100 and 150 m from end A. Calculate the potential difference at each load point if potential difference of 250 V is maintained at point A. **07**
- Q.3** (a) Explain Kelvin's law for most economical size of conductor. What are the limitations of this law. **07**
 (b) A single phase distributor AB has loop resistance of 0.3 ohm and reactance of 0.4 ohm. The far end of the distributor has a load current of 80 A and p.f. 0.8 lagging at 220 V. The mid point M of the distributor has a load current of 50 A at p.f. 0.707 lagging with reference to voltage at B. Calculate the sending end voltage and power factor. **07**
- OR**
- Q.3** (a) Explain the following distribution system with figures. **07**
 (1) Radial system
 (2) Parallel or Loop system
 (3) Network or Grid system
 (b) Explain **07**
 (1) Selection of arrester voltage rating
 (2) Arrester discharge voltage
 (3) Arrester discharge current
- Q.4** (a) Explain the design considerations for EHV transmission lines. **07**
 (b) Discuss briefly the design consideration in distribution system. Define and explain the terms: Feeder, distribution and service mains. **07**
- OR**
- Q.4** (a) Explain step potential, touch potential and earthing grid. **07**
 (b) Explain the types of DC links used in HVDC transmission. **07**
- Q.5** (a) What is insulation co-ordination. Explain insulation levels of various substation **07**

equipments for 132 KV substation.

(b) Explain Gas Insulated substation. **07**

OR

Q.5 (a) Explain Radio and Television interference. **07**

(b) Explain how will you select the sizes and location of generating substations. **07**
