

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER-VIII (NEW) EXAMINATION – WINTER 2020

Subject Code:2180903

Date:25/01/2021

Subject Name:Power System Planning and Design

Time:02:00 PM TO 04:00 PM

Total Marks: 56

Instructions:

1. Attempt any FOUR questions out of EIGHT questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

		MARKS
Q.1	(a) Why transmission should be carried out at high voltages?	03
	(b) What do you mean by compensation with refer to transmission line? Explain shunt compensation	04
	(c) Discuss the following factors to be taken into consideration in the mechanical design of a transmission line. (1) Loading on the conductors (2) Span, sag and tension. (3) Clearance from the ground.	07
Q.2	(a) Explain the terms with reference to reliability assessment (1) MTTF (2) MTTR (3) MTBF	03
	(b) Differentiate between equipment earthing and system grounding.	04
	(c) What is meant by stringing of line conductors? What is a stringing chart? How it is prepared and what is its use?	07
Q.3	(a) What do you understand by tuned power lines?	03
	(b) Define critical disruptive voltage and visual critical voltage	04
	(c) A two conductor street main AB, 500 meters in length is fed from both the ends at 250 V. Loads of 50 A, 60 A, 40 A and 30 A are tapped at distances of 100 m, 250 m, 350 m and 400 m from the end A respectively. If the cross section of the conductors is 1 cm ² and specific resistance of the material of the conductors is 1.7μ Ω-cm, determine the minimum consumer voltage.	07
Q.4	(a) What are sag templates?	03
	(b) Discuss the various methods of voltage regulation used in distribution system	04
	(c) A single phase a.c. distributor 500 m long has a total loop impedance of (0.02 + j0.04) Ω and is fed from one end at 250V. It is loaded as under: 1. 50 A at unity power factor, 200 m from the feeding point. 2. 100 A at 0.8 power factor lag, 300 m from the feeding point. 3. 50 A at 0.6 power factor lag, at the far end. Calculate the total voltage drop in the distributor and the voltage at the far end.	07
Q.5	(a) Explain (1) BIL (2) protective margin	03
	(b) Discuss why earth wire is required for overhead transmission lines. Where is it located on the transmission line towers?	04
	(c) Explain any one method of measuring soil resistivity and earthing resistance	07
Q.6	(a) Define dry flash over voltage, wet flashover voltage and impulse	03

- flash over voltage. www.FirstRanker.com www.FirstRanker.com
- (b) Write a note on location of lightning arrester **04**
- (c) Explain main considerations in planning and designing generating stations in power systems with reference to the following: (1) Role of different types of power plants in large power systems. (2) Choice of generator unit constants. **07**
- Q.7** (a) Write a note on selection of location for power plants **03**
- (b) Write a note on transmission system planning. **04**
- (c) Discuss in detail the steps in planning and designing electrical distribution schemes **07**
- Q.8** (a) Explain radio and television interference. **03**
- (b) What are the different methods of load forecasting? **04**
- (c) Explain the financial aspects of power system improvement scheme. **07**

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