Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–V • EXAMINATION – SUMMER • 2015

Subject Code:150801 **Date:05/05/2015**
Subject Name: Electrical Power Engineering
Time: 02.30pm-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)**	Draw and explain the schematic arrangement of Hydro-electric power plant. also give the factors affecting the site selection of Hydro-electric power station.	**07**
	(b)	State the different methods for power factor improvement. Explain any one in detail.	**07**
Q.2	**(a)**	Explain the following in detail. (1) Radial distribution system and (2) Ring main distribution system.	**07**
	(b)	Draw and explain the phasor diagram for an a.c. distributor with power factors referred to the receiving end voltage.	**07**
		OR	
	(b)	A supply company offers the following alternative tariffs. (1) Standing charges of Rs. 75 per annum plus 3 paise/kwh. (2) First 300 kwh at 20 paise/kwh; additional energy at 5 paise/kwh. If the annual consumption is 1800 kwh, which tariff is more economical and how much.	**07**
Q.3	**(a)**	Give in detail the Comparison between Thermal, Hydro and Nuclear power plant.	**07**
	(b)	Derive ABCD constants of Medium transmission line using Nominal T and Π methods.	**07**
		OR	
Q.3	**(a)**	What is String efficiency? Explain methods to improve it.	**07**
	(b)	Derive an expression for the inductance of three phase line with conductor having equilateral spacing.	**07**
Q.4	**(a)**	Define sag of overhead transmission line and derive the equation of sag for equal level line supports with effect of wind pressure and ice loading.	**07**
	(b)	Explain (1) Load factor (2) Demand factor (3) Diversity factor (4) Plant capacity factor and (5) Plant Use Factor.	**07**
		OR	
Q.4	**(a)**	Explain with line diagram various bus bar arrangements used in substation.	**07**
	(b)	A transmission line has a span of 275 m between level supports. The conductor has an effective diameter of 1.96 cm and weighs 0.865 kg/m. Its ultimate strength is 8600 kg. If the conductor has ice coating of radial thickness 1.27 cm and is subjected to a wind pressure of 3.9 gm/cm^2 of projected area, calculate sag for a safety factor of 2. Weight of 1 c.c. of ice is 0.91 gm.	**07**
Q.5	**(a)**	Compare EHVAC and HVDC electric systems.	**07**
	(b)	Classify the Underground cables. Also describe the general construction of an underground cable with neat sketch.	**07**
		OR	
Q.5	**(a)**	Explain working of Tap changing transformer. (On Load)	**07**
	(b)	Explain FACTS devices.	**07**

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