Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–V EXAMINATION – WINTER 2015

Subject Code: 150801 Date:17/12/2015

Subject Name: Electrical Power Engineering

Time: 10:30am to 1:00pm 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 schematic diagram of Thermal Power Plant. Also explain functions of following: (1) Economiser (2) Air pre-heater (3) ID-fan & FD-fan	07
	(b)	A 1-phase motor connected to 400 V, 50 Hz supply takes 30A at a p.f. of 0.70 lag. Calculate the capacitance required in parallel with motor to raise p.f. to 0.90 lag.	07
Q.2	(a)	Compare A.C and D.C power supply scheme.	07
	(b)	What is meant by Corona? What are the various factors which affect Corona? How can the corona effect be minimized?	07
		OR	
	(b)	An industrial consumer having a maximum demand of 100 kW maintains a load factor of 60%. The tariff rates are Rs 900 per kVA of maximum. Demand plus Rs 1.80 per kWh of energy consumed. If the average power factor is 0.8 lagging, calculate the total energy consumed per annum and the annual electricity bill.	07
Q.3	(a)	Derive the ABCD parameter for Nominal π Medium transmission line.	07
	(b)	A 350m, 2-wire DC distributor fed from one end is loaded uniformly at the rate of 1.5 A/metre. The resistance of each conductor is 0.0002 Ω per metre. Find the voltage necessary at feed point to maintain 250V (i) at the far end (ii) at the mid-point of the distributor.	07
		OR	
Q.3	(a)	Explain string efficiency and methods of improving it.	07
	(b)	Discuss the merits and demerits of Underground and Overhead systems.	07
Q.4	(a)	Write a note on Tap changing transformer. (ON load)	07
	(b)	Derive the solution of a Medium Transmission Line using Nominal π configuration. Also draw the phasor diagram assuming of Nominal π configuration.	07
		OR	
Q.4	(a)	Explain with line diagram various bus bar arrangements used in Sub-station.	07
	(b)	Explain (1) Load factor (2) Demand factor (3) Diversity factor (4) Load duration curve	07
Q.5	(a)	A two conductor street mains AB, 500 m in length is fed from both ends at 250 V. Loads 50 A, 60 A, 40 A and 30 A are tapped at distance of 100 m, 250 m, 350 m and 400 m from A respectively. If cross section area of the conductors be	07

1 cm2 and specific resistance of conductors is 1.7 × 10-8 Ωm. Determine minimum consumer voltage.

(b) State the types of unsymmetrical fault analysis & explain any one in detail. 07

OR

Q.5 (a) Explain the working of a hydro Power Plant with its neat schematic diagram. Also explain its merits and de-merits. 07

(b) Explain the various methods of Power factor improvement. 07

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