Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–IV(New) • EXAMINATION – WINTER 2016

Subject Code:2142404 **Date:18/11/2016**

Subject Name:Basic Power Systems

Time:02:30 PM to 05:00 PM **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**

Q.1		**Short Questions**	**14**
	1	Explain the function of surge tank	
	2	Explain the function of draft tube.	
	3	Why power factor is not more than unity?	
	4	Define synchronous condenser.	
	5	Define string efficiency.	
	6	What is the string efficiency in DC system?	
	7	Define sag in overhead line.	
	8	Define skin effect.	
	9	What is the advantage of bundle conductor?	
	10	Define Ferranti effect.	
	11	Define PU system.	
	12	Define corona.	
	13	What is the length of short transmission line?	
	14	Why we use isolator on both side of circuit breaker?	
Q.2	**(a)**	Discuss disadvantage of low power factor.	**03**
	(b)	Enlist the basic equipments used in HVDC transmission. Give the comparison between overhead and underground system.	**04**
	(c)	Draw and explain schematic arrangement of Gas turbine power plant.	**07**
		OR	
	(c)	Draw and explain schematic arrangement of Thermal power plant.	**07**
Q.3	**(a)**	List the advantages and disadvantages of Nuclear power station.	**03**
	(b)	With diagram explain Pin type insulator.	**04**
	(c)	Derive an expression for the most economical value of power factor which may be attained by a consumer.	**07**
		OR	
Q.3	**(a)**	Discuss the various methods to reduce the corona effect in overhead transmission line.	**03**
	(b)	Explain performance of single-phase short transmission line.	**04**
	(c)	Derive the equation of the capacitance in case of single phase transmission line.	**07**
Q.4	**(a)**	What is transposition? Discuss the importance of transposition in transmission line.	**03**
	(b)	Explain various methods to improving string efficiency.	**04**
	(c)	List the methods for solution of medium transmission lines. Explain nominal T method.	**07**
		OR	
Q.4	**(a)**	List advantages of neutral grounding.	**03**
	(b)	Define the grounding and explain solid grounding with diagram.	**04**
	(c)	Explain the basics of symmetrical component transformation. Derive equations of V_{a1}, V_{a2}, and V_{a0}.	**07**
Q.5	**(a)**	What is substation? Give the name of that factor should be taken care of while designing and erecting a substation.	**03**
	(b)	What are the merits of HVDC transmission?	**04**

	(c)	Derive the equation of an inductance of a conductor and loop inductance for single-phase two wire line.	**07**

OR

Q.5	**(a)**	Draw the key diagram of 11kV/400V sub-station.	**03**
	(b)	Explain end condenser method for medium transmission line.	**04**
	(c)	Write the principle of HVDC transmission. Explain its operation and control techniques with the help of block diagram.	**07**

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