Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–IV(New) EXAMINATION – SUMMER 2016

Subject Code:2142404 **Date:26/05/2016**

Subject Name:Basic Power Systems

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		**Short Questions**	**14**
	1	For high head hydro electric plants, the turbine used is_____.	
	2	The major heat loss in a steam power station occurs in _____.	
	3	The power factor of an a.c. circuit is given by _____ power divided by _____ power.	
	4	The potential across the various discs of suspension string is different because of _____ capacitance.	
	5	Define string efficiency.	
	6	If the length of a transmission line increases, the inductance is _____.	
	7	For power factor correction, the capacitance required is proportional to _____.	
	8	Define Neutral Grounding.	
	9	Ferranti effect on long overhead line is experienced, when it is _____ loaded.	
	10	Control rods used in nuclear reactors are made of _____.	
	11	The length of a short transmission line is up to _____ km.	
	12	AC filters supplies _____ power to HVDC systems.	
	13	Pole mounted sub-stations are used for _____ distribution.	
	14	Define voltage regulation of a transmission line.	
Q.2	**(a)**	List the advantages and disadvantages of Nuclear power station.	**03**
	(b)	Draw the schematic arrangement of Steam power station. Label each part.	**04**
	(c)	Derive the equation for the most economical power factor.	**07**
		OR	
	(c)	List disadvantages of low power factor. Also list causes of low power factor.	**07**
Q.3	**(a)**	Define Corona. List factors affecting Corona.	**03**
	(b)	Define Sag. Derive the equation of Sag, when supports are at equal level.	**04**
	(c)	Derive the equation of an inductance of a conductor and loop inductance for single-phase two wire line.	**07**
		OR	
Q.3	**(a)**	Explain Skin effect and Proximity effect in brief.	**03**
	(b)	Derive the equation of a capacitance of conductor for three-phase overhead line with symmetrical spacing of conductors.	**04**
	(c)	List the types of insulators used in transmission lines. Explain Pin type and Suspension type insulators in detail.	**07**
Q.4	**(a)**	Explain the Ferranti effect.	**03**
	(b)	Explain performance of single-phase short transmission line.	**04**
	(c)	List advantages and disadvantages of HVDC systems.	**07**
		OR	
Q.4	**(a)**	Draw the arrangement of main components of HVDC transmission system and	**03**

explain it in brief.

	(b)	Explain types of DC links in brief.	**04**
	(c)	List the methods for solution of medium transmission lines. Explain end condenser method. List limitations of it.	**07**
Q.5	**(a)**	List advantages of neutral grounding.	**03**
	(b)	Explain voltage transformer earthing.	**04**
	(c)	Explain bus bar arrangements in substation.	**07**

OR

Q.5	**(a)**	Compare indoor and outdoor substations.	**03**
	(b)	Explain underground substation.	**04**
	(c)	List methods of neutral grounding. Explain solid grounding in detail.	**07**

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