Seat No.: _____ **Enrolment No._____**

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–IV (NEW) - EXAMINATION – SUMMER 2017

Subject Code: 2142404 **Date: 30/05/2017**

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.**

			MARKS
Q.1		**Short Questions: Fill in the blanks with appropriate options given into bracket.**	**14**
	1	To increase the efficiency of the boiler in Thermal Power Station the coals are burned in a _____ (powder / Raw / Grit) form.	
	2	Manometer is used in _____ (Thermal / Hydro-electric / Nuclear) Power Station at the inlet of the water turbine for measurement of the pressure energy of the water.	
	3	Gas Turbine is used in _____ Power Station. (Thermal / Hydro-electric / Nuclear).	
	4	In HVDC transmission _____ system is installed for AC to DC conversion. (Inverter / Converter / Chopper / cyclo-converter)	
	5	Most of the electrical appliances have _____ power factor. (leading / lagging / unity)	
	6	To improve the power factor at sub-station in power system _____ is installed. (synchronous condenser / capacitor bank / phase advancer / Induction Motor)	
	7	The power factor of an AC circuit is given by _____ power divided by _____ power. (active / reactive / apparent)	
	8	The lagging power factor is due to _____ power drawn by the circuit. (active / reactive / apparent)	
	9	The maximum value of power factor can be _____. (1.1, 1, 0.9)	
	10	Transposition is associated with _____. (Feeder line / Distribution line / Transmission line).	
	11	Fuse is provided for _____ protection. (over current / over voltage / under voltage)	
	12	Spillways, Tunnels & Catchment areas are associated with _____. (Hydro-electric power station / thermal power station /	
	13	In sub-station to obtain the neutral point, a special _____ is installed for the purpose of earthing. (Earthing Transformer / Potential transformer, Current Transformer)	
	14	In Solar Power Station, _____ are used to harness the power. (photovoltaic cell / decomposable cell / biodegradable cell)	
Q.2	**(a)**	Draw the Bus-bar arrangements in sub-station.	**03**
	(b)	Compare the indoor and outdoor Sub-stations	**04**
	(c)	Enlist the equipment along with its symbols used in Sub-stations.	**07**
		OR	
	(c)	Explain Under Ground Sub-station.	**07**

Q.3	**(a)**	Enumerate the criteria to be taken into consideration for the selection of site for steam power station.	**03**
	(b)	List the advantages and disadvantages of steam power station	**04**
	(c)	Draw and explain the schematic arrangement of Steam power station.	**07**

OR

Q.3	**(a)**	Discuss Main Components of Overhead Lines.	**03**
	(b)	What is transposition? Discuss the importance of transposition in transmission line.	**04**
	(c)	Derive the equation for Inductance of a single phase two wire line transmission.	**07**
Q.4	**(a)**	Explain the Ferranti effect with necessary diagram	**03**
	(b)	Discuss Concept of Symmetrical Components.	**04**
	(c)	Explain Sending End Power Circle Diagram and deduce necessary equation.	**07**

OR

Q.4	**(a)**	Draw the arrangement of main components for HVDC transmission system and explain it in brief.	**03**
	(b)	Explain types of DC links in brief.	**04**
	(c)	List advantages and disadvantages of HVDC systems.	**07**
Q.5	**(a)**	What is power factor? Draw and explain power triangle.	**03**
	(b)	Enumerate the causes of Low Power Factor.	**04**
	(c)	Enlist the different methods of power factor improvement and explain any two in detail.	**07**

OR

Q.5	**(a)**	Define the grounding and explain Neutral grounding.	**03**
	(b)	Discuss requirement and advantages of Neutral Grounding.	**04**
	(c)	Explain the solid grounding with necessary diagram.	**07**

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