

GUJARAT TECHNOLOGICAL UNIVERSITY**BE- SEMESTER-V (NEW) EXAMINATION – WINTER 2020****Subject Code:3150911****Date:29/01/2021****Subject Name:Power System- II****Time:10:30 AM TO 12:30 PM****Total Marks: 56****Instructions:**

1. Attempt any FOUR questions out of EIGHT questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

		MARKS
Q.1	(a) Explain Types of Transmission Line.	03
	(b) Write a short note on	04
	(I) Ferranti effect	
	(II) Tuned power lines	
	(c) Using Rigorous, Derive expressions for sending end voltage current for long transmission line.	07
Q.2	(a) What is p.u. system? Give the advantages of p.u. system	03
	(b) Explain power in single phase AC circuits briefly	04
	(c) A synchronous generator is rated 645 MVA, 24 KV, 0.9 pf lagging. It has a synchronous reactance 1.2Ω . The generator is feeding full load at 0.9 pf lagging at rated voltage. Calculate:	07
	(a) Excitation emf (E_f) and power angle δ	
	(b) Reactive power drawn by the load	
	Carry out calculations in pu form and convert the result to actual values.	
Q.3	(a) Give classification of faults. What is difference between steady state reactance X_d , transient reactance X_d' and sub-transient reactance X_d'' ?	03
	(b) What is receiving end power circle diagram? Write down steps to draw it.	04
	(c) Explain factors deciding selection of circuit breaker.	07
Q.4	(a) Explain the performance of loaded Synchronous Machine.	03
	(b) Why does a generator produce only positive sequence voltage?	04
	(c) A 50 Hz transmission line 300 km long has a total series impedance of $40 + j125 \text{ ohms}$ and a total shunt admittance of 10^{-3} mho . The receiving end load is 50MW at 220 KV with 0.8 lagging pf. Find the sending end voltage, current, power and power factor using nominal – π method.	07
Q.5	(a) What are symmetrical components and its need?	03
	(b) Write and explain symmetrical component transformation	04
	(c) Using appropriate interconnection of sequence networks, derive the equation for a line to line fault in a power system with fault impedance of Z_f .	07
Q.6	(a) Differentiate symmetrical and unsymmetrical faults. List various unsymmetrical faults.	03
	(b) Write equation of phase voltage in terms of symmetrical components	04
	(c) Explain sequence impedances and networks of synchronous machine.	07

- Q.7 (a) Explain the phenomena of corona www.FirstRanker.com www.FirstRanker.com 03
(b) Explain overvoltage due to arcing ground with necessary vector diagram. 04
(c) Derive the equation for attenuation of travelling waves 07
- Q.8 (a) Write a brief note on capacitance switching. 03
(b) Give reasons for following: The disruptive critical voltage is less than visual critical voltage. 04
(c) Explain travelling waves of a transmission line when the receiving end is short circuited. 07

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