

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

- Q.7** (a) Explain the phenomena of corona **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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