GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER–VI (NEW) EXAMINATION – SUMMER 2021

Subject Code:2160908   **Date:04/08/2021**

Subject Name:Electrical Power system – II

Time:02:30 PM TO 05:00 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	**(a)**	Define " Regulation " and " Efficiency " of transmission line	**03**
	(b)	Explain in brief performance analysis of short transmission line.	**04**
	(c)	A single phase 11KV line with a length of 15km is to transmit 500KVA.The inductive reactance of the line is 0.5Ω per km and the resistance 0.3Ωperkm. Calculate the efficiency and regulation for 0.8p.f.lagging	**07**
Q.2	**(a)**	Distinguish between symmetrical and unsymmetrical fault.	**03**
	(b)	Explain steady state , sub-transient and transient reactance of synchronous machine	**04**
	(c)	Explain transients in R-L series circuit	**07**

OR

	(c)	Write short note on Rigorous method used for performance analysis of long transmission line.	**07**
Q.3	**(a)**	Explain in brief complex operator (α)	**03**
	(b)	What are different types of symmetrical components? Explain in brief.	**04**
	(c)	A synchronous generator is rated at 25 MVA, 11 kV. It is star connected with neutral point solidly grounded. The generator is operating on no-load at rated voltage. Its reactances are $X" = X_2 = 0.2$ p.u. and $X_0 = 0.08$ p.u. Calculate the symmetrical subtransient currents for (i) LG fault (ii) LL fault (iii) LLG fault (iv) LLL fault.	**07**

OR

Q.3	**(a)**	Give reasons. The analysis of unsymmetrical faults can be more easily done with the help of symmetrical components than by direct solutions of unbalanced circuit.	**03**
	(b)	Derive line to ground fault in 3 phase alternator	**04**
	(c)	A 25 MVA, 11 kV generator has $X_1 = 0.2$ p.u., $X_2 = 0.3$ p.u. and $X_0 = 0.1$ p.u. The neutral of the generator is solidly grounded. Determine the sub-transient current in the generator and the line-to-line voltage for sub-transient condition when a Y-B-G fault occurs at the generator terminals. Assume pre-fault currents and fault-resistance to be zero	**07**
Q.4	**(a)**	Define fault and explain in brief importance of fault studies.	**03**
	(b)	Write short note on static VAR Compensator.	
	(c)	A 120km 3phase,50hz transmission line has the following parameters R=0.2Ω/km, L=1.2mH/km and C=0.014µF.A voltage at receiving end is 132KV .Determine the sending end voltage and efficiency using nominal T-method if line deliver 45MW at 0.85 p.f. lagging.	**07**

OR

Q.4	**(a)**	State the advantages of p.u. system.	**03**

(b) Define A, B, C, D constants of transmission line? What are their values in short line? **04**

(c) A 33KV single circuit,3-phase transmission line has ABCD parameters $A=D=1\angle 0°$, $B=11.18\angle 63.43°$. The line is deliver 7.5 MVA at 0.85 pf lagging at load end.Receving end voltage is 32 KV (line to line).How much active and reactive power is to dispatch from sending end. **07**

Q.5 **(a)** What is the difference between reflection and refraction of waves? **03**

(b) Explain attenuation of travelling waves. **04**

(c) Write short note on travelling waves on transmission lines. **07**

OR

Q.5 **(a)** Define followings term (i) transient (ii) Restacking (iii) recovery voltage **03**

(b) Define corona. What are the factors affecting corona. Explain in brief, **04**

(c) Write short note on capacitance switching **07**

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