CODE No.: 16BT60202 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Regular/Supplementary Examinations August - 2021

POWER SYSTEM ANALYSIS
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1. a) Form Y bus for the network by direct inspection method: CO4 7 Marks

Element	5-1	5-2	1-2	2-3	1-4	3-6	4-6
Positive sequence reactance	0.04	0.05	0.04	0.03	0.02	0.07	0.10

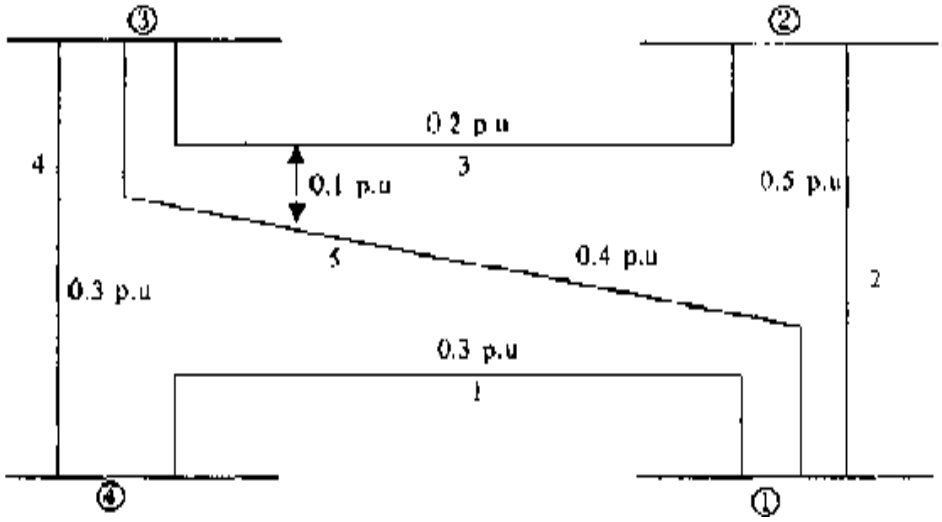
b) Define the per unit value of a quantity. How will you change the base impedance from one set of base values to another set? CO1 7 Marks

(OR)

2. a) Describe the per phase generator model with required diagrams. CO2 7 Marks
b) With neat diagrams, explain the transformer model used for per phase analysis. CO2 7 Marks

UNIT-II

3. a) Illustrate the modifications necessary in the Z_{BUS} when a mutually coupled element is removed. CO5 7 Marks
b) Using the building algorithm construct Z_{BUS} for the system shown in figure. Choose 4 as reference bus. CO4 7 Marks



(OR)

4. a) Explain the procedure for modification of Z_{BUS} when a line is added, which has no mutual reactance. CO5 7 Marks
b) Form bus impedance matrix for the data given below. CO3 7 Marks

Element number	Bus code From bus – To bus	Self-impedance
1	2-3	0.6 p.u.
2	1-3	0.5 p.u.
3	1-2	0.4 p.u.

UNIT-III

5.		Explain the step by step computational procedure for the Gauss-Seidel method of load flow studies when the system contains all types of buses.	CO5	14 Marks

(OR)

6.	a)	What are the assumptions made in reducing Newton Raphson method to decoupled method for power flow solution?	CO1	7 Marks
	b)	Derive the static load flow equations of n-Bus system.	CO2	7 Marks

UNIT-IV

7.	a)	With the help of a detailed flow chart, explain how a symmetrical fault can be analysed using Z_{BUS}.	CO2	7 Marks
	b)	What are the various types of faults? Discuss their frequency of occurrence and severity. Find the fault current when an L-L-G fault occurs at the terminals of an unloaded generator.	CO3	7 Marks

(OR)

8.	a)	Illustrate the procedure for making short circuit studies of a large power system.	CO1	7 Marks
	b)	A 3-phase, 25 MVA, 11 KV alternator has internal reactance of 6%. Find the external reactance per phase to be connected in series with the alternator so that steady state short circuit current does not exceed six times the full load current.	CO3	7 Marks

UNIT-V

9.	a)	Discuss the various factors affecting the transient stability of the system.	CO1	7 Marks
	b)	Explain the equal area criterion. How it is useful for predicting system stability?	CO4	7 Marks

(OR)

10.	a)	Write short notes on assumptions made in deducing equal area criterion.	CO1	7 Marks
	b)	Define steady state stability and explain the methods for improving steady state stability.	CO5	7 Marks