



**R18 Regulation** **Subject code: 2P6BC**  
**TKR COLLEGE OF ENGINEERING AND TECHNOLOGY**  
 (Autonomous, Accredited by NAAC with 'A+' Grade)  
**B.Tech VI Semester Supplementary Examinations, July 2024**

**POWER SYSTEM ANALYSIS**  
**(EEE)**

**Maximum Marks: 70**

**Date: 24.07.2024 Duration: 3 hours**

- Note:**
1. This question paper contains two parts A and B.
  2. Part A is compulsory which carries 20 marks. Answer all questions in Part A.
  3. Part B consists of 5 Units. Answer any one full question from each unit which carries 10M.
  4. Each question carries 10 marks and may have a, b, c, d as sub questions.

**Part-A**

All the following questions carry equal marks		(10X2M=20 Marks)	CO	Bloom Tx
1	Define tree.		1	L1
2	$Z_{li} =$ $Z_{ll} =$		1	L1
3	Define PQ Buses		2	L1
4	What are the advantage of NR method		2	L1
5	What is the relation between symmetrical compound and un symmetrical compounds		3	L1
6	Draw the equivalent diagram of line to ground fault.		3	L1
7	What are the other name of torque angles		4	L1
8	Define stability		4	L1
9	What are classification of power system stability		5	L1
10	Give Expression for swing equation		5	L1

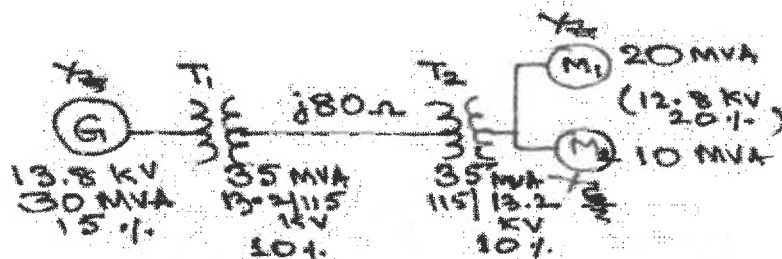
**Part-B**

Answer All the following questions. (5X10M=50Marks)

11 Write a short note on- Per Unit, advantages of per unit system, Primitive network and Basic incident matrix(A). 10M

OR

12 The one-line diagram with the data is obtained as shown in figure. of base quantities: 30 MVA, 13.8 KV. Draw the Reactance diagram. 10M



13 A. Write a short note on classification of buses. 5M

	B. Briefly explain the GS Method with PQ buses in load flow studies. 5M																														
	OR																														
14	Carry out one iteration of load flow analysis of the system given below by Gauss-Seidel method. 10M	2	L2																												
	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Bus no.</th> <th>Bus type</th> <th>p</th> <th>q</th> <th>Remark</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Slack</td> <td>-</td> <td>-</td> <td>1.02V</td> </tr> <tr> <td>2</td> <td>p-q</td> <td>0.8</td> <td>0.9</td> <td>-</td> </tr> <tr> <td>3</td> <td>p-q</td> <td>1.0</td> <td>0.4</td> <td>-</td> </tr> </tbody> </table> <p>Line reactance in p.u</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Bus code</th> <th>impedance</th> </tr> </thead> <tbody> <tr> <td>1-2</td> <td>J0.5</td> </tr> <tr> <td>2-3</td> <td>J0.5</td> </tr> <tr> <td>3-1</td> <td>J0.5</td> </tr> </tbody> </table>	Bus no.	Bus type	p	q	Remark	1	Slack	-	-	1.02V	2	p-q	0.8	0.9	-	3	p-q	1.0	0.4	-	Bus code	impedance	1-2	J0.5	2-3	J0.5	3-1	J0.5		
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15	A. Write a short notes on sequence operation of a. 4M B. Compute the following in polar form 6M 1) $a^2-1$ 2) $1-a-a^2$ 3) $3a^2+4a+2$	3	L2																												
	OR																														
16	Derive an expression for Fault current LG fault with fault impedance 10M	3	L2																												
17	A generator supplies 1.0 p.u power to an infinite bus as shown in fig. the terminal voltage and infinite bus voltage are 1.0p.u. all the reactance are on common base . Determine study state stability. 10M a) when both lines are in b) when one line vis switched off	4	L2																												
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18	A generator operating at 50hz delivers 1 p.u power to an infinite bus through a transmission circuit in which resistance is ignored. A fault takes place reducing the maximum power transfereble to 0.5 p.u where before the fault this power was 2.0 p.u and after the clearance of the fault it is 1.5 p.u . by the use of equal area criterion determine the critical clearing angle. 10M	4	L2																												
19	Classify the different types of stability. 10M	5	L2																												
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20	A. What are the steps to be followed for determining multimachine stability. 5M B. Write the expression for critical clearing time. 5M	5	L2																												