Exam. Code: 0936
Sub. Code: 33767

2015

B.E. (Electrical and Electronics Engineering)

Sixth Semester

PC-EE-601: Computer Aided Power System Analysis (CAPSA)

Time allowed: 3 Hours **Max. Marks: 50**

NOTE: ***Attempt five questions in all, including Question No. I which is compulsory and selecting two questions from each Part.***

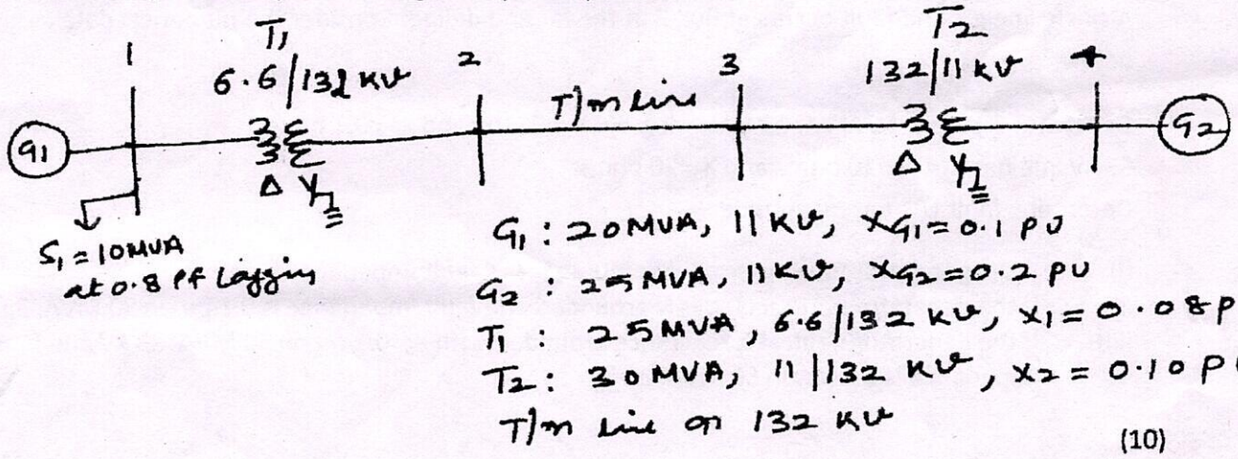
x-x-x

1. (a) How symmetrical faults are solved.
   (b) Why NR method is preferred for load flow analysis?
   (c) Draw sequence networks for delta connected loads.
   (d) What is frequency regulation?
   (e) What is limit of steady state stability?

(5*2=10)

PART-A

2 Draw single line diagram of the given figure in per unit values.



G_1 : 20MVA, 11KV, $X_{G1} = 0.1$ PU
G_2 : 25MVA, 11KV, $X_{G2} = 0.2$ PU
T_1 : 25MVA, 6.6/132 KV, $X_1 = 0.08$ PU
T_2 : 30MVA, 11/132 KV, $X_2 = 0.10$ PU
T/m Line on 132 KV

(10)

3. (a) What is the role of slack bus in power system analysis?
   (b) Consider the given 3-bus system. The per unit reactance of each line is j0.2 while line resistances are ignored.

Bus No	Type	Voltages (pu)	P_G	Q_G	P_D	Q_D
1	Slack	$1.0\angle 0^0$	-	-	-	-
2	PQ	$1.01\angle -8^0$	0.6	0.4	0.5	0.3
3	PQ	$0.97\angle -10^0$	-	-	0.7	0.2

From	To
1	2
1	3
2	3

Determine load flow solution using Gauss-Seidel method for one iteration.

(4,6)

P.T.O.

4. (a) What is frequency regulation? How it is achieved using Governor control?

(b) Discuss equal area criterion method to a parallel transmission line when there is fault is at the middle of a transmission line.

(5,5)

PART-B

5 (a) Discuss the algorithm for solving 3-phase symmetrical faults on an unloaded synchronous machine.

(b) A three phase 10 MVA, 11kV alternator has 10% sub-transient reactance. Find short circuit MVA and current if symmetrical fault occurs at its terminal.

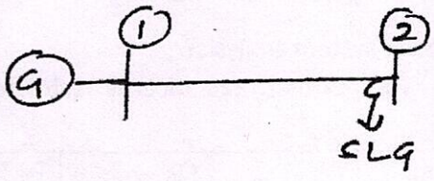
(5,5)

6. Consider the power system as shown in Fig

A single line ground fault occurs at Bus-2 at the far end of line. Consider the numerical data as given below:

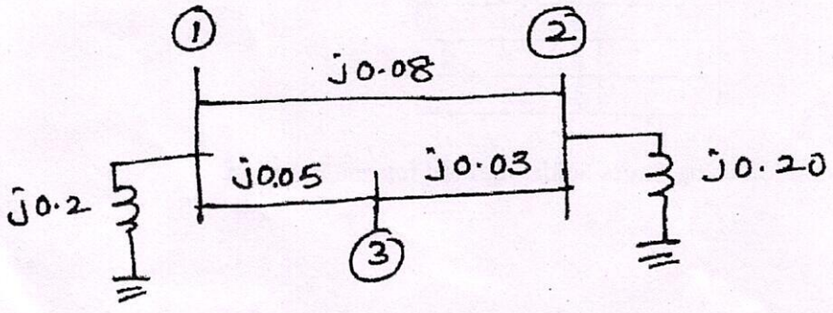
Generator 3-phase, 50 MVA, 33 kV having $X_1 = X_2 = 0.2$ pu and $X_0 = 0.1$ pu
33 kV line has $X_1 = X_2 = 10$ ohms and $X_0 = 20$ ohms
Determine fault current magnitude

(i) If the generator neutral is solidly grounded and fault impedance is zero.
(ii) If the generator neutral is solidly grounded and fault impedance is 0.1 pu on 50 MVA, 33 kV.
(iii) If the generator neutral is reactance grounded with $X_n = 0.1$ pu on 50 MVA, 33 kV and fault impedance is 0.1 pu on 50 MVA, 33 kV



(10)

7. Find Zbus of the given data using step by step algorithm



(10)