



(Pages : 3)



3033

Reg. No. : .....

Name : .....

**Sixth Semester B.Tech. Degree Examination, June 2018**

**(2008 Scheme)**

**08.605 : POWER SYSTEM ENGINEERING – II (E)**

Time : 3 Hours

Max. Marks : 100

**PART – A**

Answer **all** questions :

1. List the assumptions and procedure involved in fault calculation.
2. What is the purpose of using reactors in the bus bars ?
3. For a fault at alternator terminals, a single line to ground fault is generally more severe than a 3-phase fault. Why ?
4. Draw and explain the typical time-current characteristics of a fuse.
5. What is the problem associated with the interruption of capacitive current ?
6. Write a brief note on HVDC circuit breakers.
7. Draw a neat sketch of an air break circuit breaker.
8. Distinguish between primary and back up protection.
9. What are the different protective schemes for transformers ?
10. What is meant by step and touch voltage ?

**(10×4=40 Marks)**

P.T.O.

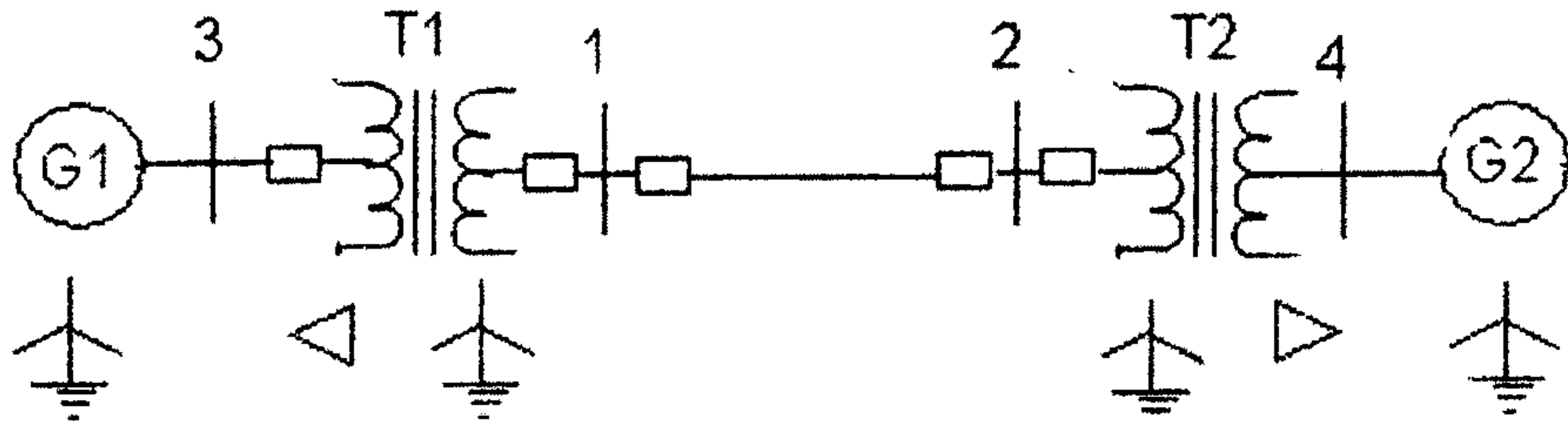


## PART - B

Answer **one full** question from **each** Module.

## Module - I

11.



The reactance data for the power system shown in figure in pu on a common base is as follows : G1 and G2 :  $X_1 = X_2 = 0.10$ ;  $X_0 = 0.05$ ; T1 and T2 :  $X_1 = X_2 = X_0 = 0.25$ ; Line 1-2 :  $X_1 = X_2 = 0.30$ ;  $X_0 = 0.50$ . Compute the fault current in pu for a) a bolted three phase fault at bus 1 and b) a bolted single line to ground fault at bus 1.

20

OR

12. A 3 phase 33 kV 37.5 MVA alternator is connected to a 33 kV overhead line which develops an earth fault on one phase at the remote end. The +ve, -ve and zero sequence reactances of the alternator are 0.18, 0.12 and 0.1 pu on its own rating while those for the line are 6.3, 6.3 and 12.6Ω per conductor. Find a) fault current b) line to neutral voltages at alternator terminals.

20

## Module - II

13. a) Describe with neat sketches the working of an SF<sub>6</sub> circuit breaker. 10
- b) Explain current setting and time setting of an over current relay. The current rating of an over current relay is 5A. Relay setting is 200%, TMS = 0.3, CT ratio = 400/5. Determine the operating time of the relay. At TMS = 1, operating time at various PSM are

PSM	2	4	5	8	10	20
Operating time in secs	10	5	4	3	2.8	2.4

10

OR



14. a) Explain clearly discrimination, sensitivity and stability of a protective system. 10
- b) Explain the principle of distance relays stating clearly the difference between impedance relay, reactance relay and Mho relay. Draw R-X diagrams. 10

**Module – III**

15. a) With neat sketch explain the percentage differential protection employed for the protection of large Y- $\Delta$  power transformer against short circuits. 10
- b) Explain the working principle of a Buchholz relay. 10

OR

16. Write short notes on :
- a) Amplitude and phase comparators. 10
- b) Directional relay. 5
- c) Arc suppression coils. 5
-