

S. 6

Code No.: 9A02602/R09

B.Tech. III Year II Semester Regular & Supplementary Examinations

Set-2

April/May - 2013

POWER SYSTEM ANALYSIS

(Electrical and Electronics Engineering)

Time: 3 Hours

Max. Marks: 70

Answer any **FIVE** Questions

All Questions carry **Equal** Marks

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1. Explain the following,
 - (a) Cut set matrix
 - (b) Bus incidence matrix
 - (c) Branch path incidence matrix
 - (d) Basic loop incidence matrix.

2. Derive the expression for building Z_{BUS} when the added element is connected.
 - (i) Between an existing bus and a new bus
 - (ii) Between the reference bus and a new bus.Assume that the added element is mutually coupled with one or more elements of the partial network.

3. Determine the value of V_2 , V_3 and V_4 as produced by the first iteration of the G-S procedure for the data given below (Table 1 & 2)

Table 1 : Line data

Line	R_1 (pu)	X_1 (pu)
1-2	0.05	0.15
1-3	0.10	0.30
2-3	0.15	0.45
2-4	0.10	0.30
3-4	0.05	0.15

Table 2 : Load data

V(pu)	P(pu)	Q(pu)	Type of bus
$1.04\angle 0^\circ$	-	-	Slack
-	0.5	-0.2	PQ
-	-1	0.5	PQ
-	0.30	-0.1	PQ

4. Give algorithm steps for fast decoupled load flow method to find the solution of power system.

5. Explain the short circuit phenomenon in 3- ϕ synchronous generator and draw the oscillagram of short circuit current and show subtransient, transient and steady state currents.

6. Discuss the symmetrical component method to analyze an unbalanced 3-phase system.

7. Discuss the power angle curve of a synchronous machine and also give the classical representation of a synchronous machine in stability studies.

8. Derive the swing equation for a machine connected to an infinite bus in a power network and extend it for a two machine system.

B.Tech. III-Year II-Sem. _____ (JNTU-Anantapur)