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BIEEE-007

B.Tech. – VIEP – ELECTRICAL ENGINEERING (BTELVI)

Term-End Examination

00913 **December, 2016**

BIEEE-007 : COMPUTER APPLICATIONS IN POWER SYSTEMS

Time : 3 hours *Maximum Marks : 70*

Note : *Attempt **five** questions in all. All questions carry equal marks. Assume any data, if missing. Use of scientific calculator is allowed.*

1. (a) Explain in detail the terms production costs, total efficiency, incremental efficiency and incremental rates with respect to a thermal power plant. 7

(b) Explain clearly with a flow chart the computational procedure for load flow solution using Gauss-Seidel method when the system contains all types of buses. 7

2. Figure 1 shows a five-bus power system. Each line has an impedance of 0·05 + j0·15 pu. The line shunt admittance may be neglected. The bus power and voltage specifications are given below :

Bus No.	P_D	Q_D (pu)	P_G (pu)	Q_G (pu)	V (pu)	Bus Specification
1	1	0·5	–	–	1·02 + j 0	Slack
2	0	0	2	–	1·02	PV
3	0·5	0·2	0	0	–	PQ
4	0·5	0·2	0	0	–	PQ
5	0·5	0·2	0	0	–	PQ

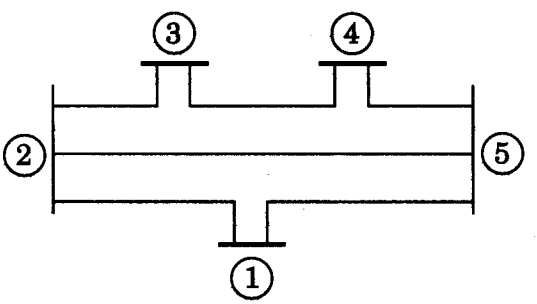

Figure 1

(a) Develop Y_{BUS} matrix.

(b) Find Q_2, δ_2, V_3, V_4 and V_5 after first iteration using GS method.
Assume $Q_{2\,min}$ = 0·2 pu and $Q_{2\,max}$ = 0·6 pu.

5+9=14

3. (a) What is an oriented graph ? Explain incidence matrix with an example. 5

(b) What are the different components of a power system ? 5

(c) Explain demand side management. 4

4. (a) Write the advantages and disadvantages of Newton-Raphson (N-R) method. 7

(b) What do you mean by load flow study ? What information is obtained from a load flow study ? 7

5. Explain the Gauss-Siedel method for load flow solution using nodal admittance approach for the formulation of load flow equations. 14

6. (a) Explain the contingency analysis for interconnectors. 7

(b) Write down the principle of operation of transformers and derive the formula for percentage copper saving in comparison to two-winding transformers. 7

7. Write short notes on any ***two*** of the following : $2 \times 7 = 14$

(a) Tap Changing Transformer

(b) Concept of Decoupled Method

(c) Transmission Losses
