BIEEE-007

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

Term-End Examination

00346   June, 2016

## BIEEE-007 : COMPUTER APPLICATIONS IN POWER SYSTEMS

Time : 3 hours   *Maximum Marks : 70*

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

1. (a)   Why are digital computers used in power system simulations ?   7

   (b)   Explain the regulatory and policy developments in power systems.   7

2. Each line between buses 1 – 2, 2 – 3, 1 – 4 has a total shunt admittance of – j 0·16 p.u. The shunt admittance of the remaining lines are neglected. Determine Y_{BUS}.   14

Line (bus to bus)	Impedance (p.u.)
1 – 2	$0.25 + j\,1.0$
1 – 3	$0.20 + j\,0.8$
1 – 4	$0.30 + j\,1.2$
2 – 3	$0.20 + j\,0.8$
2 – 4	$0.15 + j\,0.6$
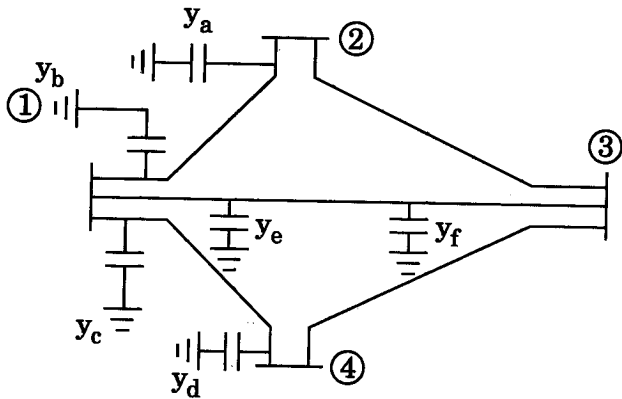
3. (a) What do you mean by oriented graph, reference direction and system graph in context with the transmission line ?   *7*

(b) Compare the different methods of load flow solutions.   *7*

4. (a) Explain the optimal load flow study of power systems.   *7*

(b) Discuss the economic load scheduling of hydro-thermal plants.   *7*

5. (a) Draw the flow chart of load flow study, using Gauss-Siedel method. Mention its advantages and limitations.   *7*

(b)   What do you understand by demand side management of power system control and management ?   7

6.   A five bus power system has been considered (Assume any type of configuration). Each line has an impedance of 0·05 + j 0·15 pu. The line shunt admittance may be neglected. The bus power and voltage specification are given in tabular form.

Bus No.	P_D	Q_D (in pu)	P_G (in pu)	Q_G (in pu)	V (in 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

(a)   Develop Y_{BUS} matrix.

(b)   Find Q_2, δ_2, V_3, V_4 and V_5 after first iteration using Gauss-Siedel method.   14

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

(a)   Two-winding   transformer   and Auto-transformer

(b)   Representation of transmission line

(c)   Tap changing transformers and loads

BIEEE-007   3   1,000