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BIEEE-007

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

00194

Term-End Examination

June, 2014

BIEEE-007 : COMPUTER APPLICATIONS IN POWER SYSTEMS

Time : 3 hours *Maximum Marks : 70*

Note : *Attempt any **seven** questions. All questions carry equal marks. Assume missing data, if any.*

1. (a) Explain in detail the classification of buses in load flow problem. *5*

(b) Derive static load flow equations. *5*

2. (a) Draw and explain the flowchart for Decoupled load flow method. *5*

(b) Formulate the power flow problem and show that it can be solved by Decoupled method. *5*

3. Develop the necessary matrices of

(a) Fault admittance matrix in phase and sequence component form. *5*

(b) Fault impedance matrix in sequence component form for a 3-phase fault at a bus in a power system for short circuit studies. *5*

4. (a) Explain why electric utility industry was regulated. 5

(b) If the converged local flow solution is available, how do you determine the slack bus complex power injection and system total loss ? 5

5. Derive necessary expression for the off diagonal and diagonal elements of the sub matrices J_1, J_2, J_3 and J_4 for carrying out a load flow study on power system by using Newton-Raphson method in polar form. 10

6. Explain in detail the terms production costs, total efficiency, incremental efficiency and incremental rates with respect to thermal power plant. 10

7. Write short notes on

(a) Advantages and disadvantages of Autotransformer over two winding transformer. 5

(b) Demand side management. 5

8. Give algorithm for economic allocation of generation among generators of a thermal system taking into account transmission losses. Give steps for implementing this algorithm and also derive necessary equation. 10

9. The fuel inputs per hour of plants 1 and 2 are given as

$F_1 = 0{\cdot}2\ P_1^2 + 40\ P_1 +$ ₹ 120 per hour

$F_2 = 0{\cdot}25\ P_2^2 + 30\ P_2 +$ ₹ 150 per hour

Determine the economic operating schedule and the corresponding cost of generation if the maximum and minimum loading on each unit is 100 MW and 25 MW, the demand is 180 MW, and transmission losses are neglected. If the load is equally shared by both the units, determine the saving obtained by loading the units as per equal incremental production cost. *10*