

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

00989

Term-End Examination

December, 2017

**BIEEE-007 : COMPUTER APPLICATIONS IN POWER
SYSTEMS**

Time : 3 hours

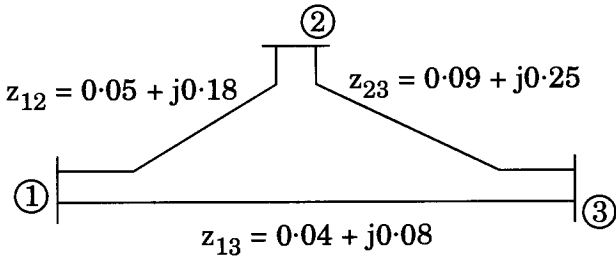
Maximum Marks : 70

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

1. (a) Draw the single line diagram of a power system representing hierarchy of transmission and distribution systems. 7

- (b) Discuss the difference between a two-winding transformer and an autotransformer. 7

2. (a) Determine Y_{bus} for a 3-bus system shown in the figure below. The line series impedances are as follows : 7



- (b) How does the Newton-Raphson method get modified to account for PV buses ? 7
3. (a) Explain the incidence matrix and cutset matrix with the help of a suitable example. 7
- (b) What do you mean by Bus Impedance algorithm ? Derive its necessary equations. 7
4. (a) How will you obtain the economic operating criterion for hydro-thermal systems with network losses considered ? 7
- (b) Develop the criterion of economic operation with restriction on fuel supply. 7
5. (a) Discuss the purpose of load flow studies of a power system. Also classify the buses for the same. 7
- (b) Explain why Y_{bus} is used for load flow solution instead of Z_{bus} . 7

6. (a) Develop the mathematical model of tap changing transformer to be represented in the formation of Y_{bus} for load flow analysis. 7
- (b) Derive the load flow equations in polar form for Newton-Raphson method. 7
7. Write short notes on any *two* of the following : $2 \times 7 = 14$
- (a) Contingency Analysis
- (b) Demand Side Management of Power Systems
- (c) Optimal Load Flow Study of Power Systems
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