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**BIEEE-007**

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

## Term-End Examination

00886

## June, 2015

## 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. Use of scientific calculator is allowed.*

1. Explain demand side management and contingency analysis for a power system. *10*

2. Write down an algorithm for the formation of Z bus matrix using four types of modification techniques. *10*

3. A constant load of 300 MW is supplied by two 200 MW generators, 1 and 2, for which the respective incremental fuel costs are

$$\frac{dC_1}{dP_{G1}} = 0{\cdot}10\, P_{G1} + 20{\cdot}0$$

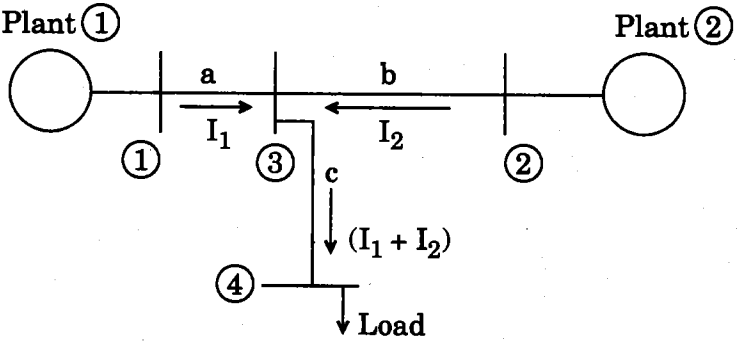
$$\frac{dC_2}{dP_{G2}} = 0{\cdot}12\, P_{G2} + 15{\cdot}0$$

with powers $P_G$ in MW and costs C in ₹/h. Determine

(a) the most economical division of load between the generators

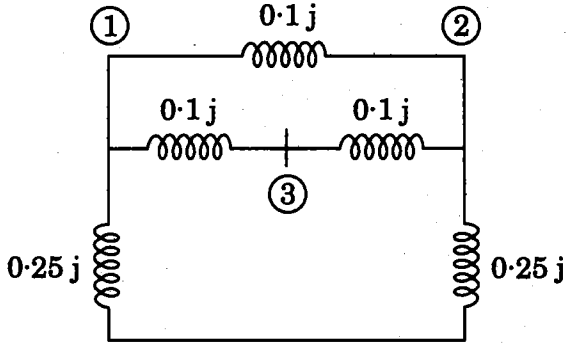
(b) the saving in ₹/day thereby obtained compared to equal load sharing between machines. *10*

**4.** For the system whose one line diagram is shown in the figure assume $I_1 = 1 \angle 0°$ per unit and $I_2 = 0{\cdot}8 \angle 0°$ per unit. If the voltage at bus 3 is $V_3 = 1 \angle 0°$ per unit, find the loss coefficients. Line impedances are (0·04 + j 0·16) per unit, (0·03 + j 0·12) per unit and (0·02 + j 0·08) per unit for sections a, b, c, respectively. *10*




**5.** Write down the principle of operation of autotransformers and derive the formula for percentage copper saving in comparison to the winding transformers. *10*

6. For the 3-bus network shown below, find the bus admittance matrix. *10*




7. Enumerate the different types of load flow methods and explain bus mismatch and convergence criteria. *10*

8. Write short notes on any ***two*** of the following : *2×5=10*

   (a) Electric supply industry structure under deregulation

   (b) Economical load scheduling of hydrothermal plants

   (c) Concepts of decoupled methods