

**BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(MID SEMESTER EXAMINATION)**

CLASS: BE
BRANCH: EEE

SEMESTER: VII
SESSION : MO/2019

SUBJECT : EE7211 COMPUTER AIDED POWER SYSTEM ANALYSIS

TIME: 1.5 HOURS

FULL MARKS: 25

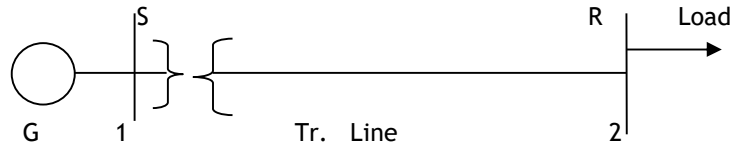
INSTRUCTIONS:

1. The total marks of the questions are 30.
2. Candidates may attempt for all 30 marks.
3. In those cases where the marks obtained exceed 25 marks, the excess will be ignored.
4. Before attempting the question paper, be sure that you have got the correct question paper.
5. The missing data, if any, may be assumed suitably.

Q1 How phase shifting transformer and three winding transformer is represented in power system? [5]

Q2 Explain with the flow chart the computational steps involved in load flow solutions by Newton Raphson method.

Q3



For the system shown above, Voltage at the slack bus (sending end) is $1+j0$ pu. Transformer reactance is $j0.4$ pu and the line admittance is $1-j4$ pu, load is $2+j0.8$ pu. Write down the expression for P_2 , and Q_2 . Obtain V_2 after one iteration using Fast Decoupled Load Flow method.

Q4 Discuss the extent of sparsity of Y bus and Jacobian matrix. Explain one method of sparsity oriented programming.

Q5 (a) Describe input-output characteristics of a steam turbine generator. [2]
(b) What is the equal λ criterion for economic load dispatch? [3]

Q6 The fuel inputs per hour of plants 1 & 2 are given as

$$F_1 = 0.2P_1^2 + 40P_1 + 120 \text{ Rs./hr.}$$

$$F_2 = 0.25P_2^2 + 30P_2 + 150 \text{ RS./hr.}$$

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 incremental production cost.

::: 23/09/2019M ::::