Code No : 20EE6T02 **R20**

III B. TECH II SEMESTER REGULAR EXAMINATIONS APRIL - 2023
POWER SYSTEMS-III
(ELECTRICAL AND ELECTRONICS ENGINEERING)

Time: 3 hours Max. Marks: 70

Note: Answer **ONE** question from each unit **(5 × 14 = 70 Marks)**

UNIT-I

1. With the help of the flow chart, explain the procedure used to solve the load flow using the Newton-Raphson method using a polar form. Assume all types of buses are there in the system. [14M]

(OR)

2. a) Compare G-S method and N- R methods of load flow solutions? [7M]
   b) Explain the necessity of Load Flow Studies? [7M]

UNIT-II

3. a) Discuss the harmful effects of short circuit fault on the power system? [7M]
   b) A 3-phase generator rated 25 MVA, 12.6kV has a solidly grounded neutral. The sequence impedances of the alternator are Z1= j0.3, Z2= j0.25 and Z0= j0.01 p.u. determine the values of (i) resistance and (ii) reactance must be placed in generator neutral for a LG fault of zero fault impedance to the rated line current? [7M]

(OR)

4. Describe the positive, negative and zero sequence impedance diagrams of unloaded alternator. [14M]

UNIT-III

5. a) Explain the elementary concepts of steady state, dynamic and transient stabilities. [7M]
   b) Illustrate the determination of transient stability by equal area criterion with three different conditions. [7M]

(OR)

6. A double circuit, 3-phase feeder connects a single generator to a large network. The power corresponding to the limit of steady state stability for each circuit is 120 MW. The line is transmitting 90 MW, where one of the circuits is suddenly switched out. Find with reference to appropriate diagram whether the generator is likely to remain in stable. [14M]

UNIT-IV

7. Draw and explain the following for a thermal power station. [14M]
   (i) input output characteristics (ii) heat rate curve (iii) incremental fuel cost curve.

(OR)

8. a) Derive the co-ordination equation of optimal allocation of total load among different units by neglecting the losses? [7M]

   b) Derive the expression for optimum generation allocation including the effect of Transmission line losses. [7M]

UNIT-V

9. Describe clearly about proportional plus integral load frequency control system with a block diagram [14M]

(OR)

10. Describe the combined LFC and economic dispatch control with block diagram. [14M]

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