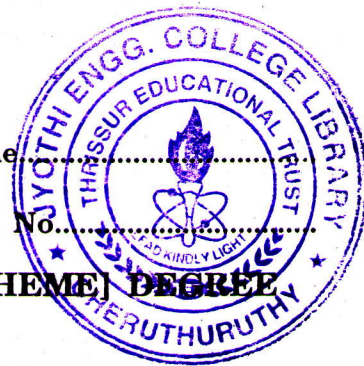


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Name .....

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**SEVENTH SEMESTER B.TECH. (ENGINEERING) [09 SCHEME] DEGREE  
EXAMINATION, NOVEMBER 2016**

**EE/PTEE 09 701—POWER SYSTEM ANALYSIS**

Time : Three Hours

Maximum : 70 Marks

**Part A**

*Answer all questions.*

*Each question carries 2 marks.*

1. Define base impedance and base kilovolt amperes.
2. List the advantages of per unit computations.
3. Write the equality and inequality constraints considered in the economic dispatch problem.
4. What are the features of zero sequence currents ?
5. Define dynamic stability with an example.

(5 × 2 = 10 marks)

**Part B**

*Answer any four questions.*

*Each question carries 5 marks.*

6. Draw and describe the per phase generator model.
7. Discuss the importance of load flow studies in power system.
8. Write short notes on load sharing.
9. Express the unbalanced voltages  $V_a$ ,  $V_b$  and  $V_c$  in terms of symmetrical components  $V_{a1}$ ,  $V_{a2}$  and  $V_{a0}$ .
10. Define the operator ' $\alpha$ ' and express the value of ' $\alpha$ ' and ' $\alpha^2$ ' in both polar and rectangular form.
11. Explain the control schemes included in stability control techniques ?

(4 × 5 = 20 marks)

**Part C**

*Answer all questions.*

*Each question carries 10 marks.*

12. (a) Describe step by step procedure for load flow solution from Gauss Siedel method, if PV and PQ buses are present along with slack bus.

(10 marks)

Or

- (b) Give detailed flow chart for Newton-Raphson method.

(10 marks)

Turn over

13. (a) Explain the term 'Incremental Operating cost' of power system related with economic dispatch. (10 marks)

Or

- (b) The fuel inputs per hour of plants 1 and 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 generation. The maximum and minimum loading on each unit is 100 MW and 25 MW. Assume the transmission losses are ignored and the total demand is 180 MW. Also determine the saving obtained if the load is equally shared by both the units.

(10 marks)

14. (a) The phase 'b' of a three-phase circuit is open. The currents in phases 'c' and 'a' are I and -I respectively. Determine the positive, negative and zero sequence components of the current in phase 'a'

(10 marks)

Or

- (b) What is meant by sequence impedance ? Explain the sequence network of an unloaded generator.

(10 marks)

15. (a) State and explain equal area criterion. How do you apply equal area criterion to find the maximum additional load.

(10 marks)

Or

- (b) With the help of a neat flowchart, explain the modified Euler method of solving the swing equations.

(10 marks)

[4 × 10 = 40 marks]