

**B.Tech Degree VIII Semester Examination, April 2010****EE 802 POWER SYSTEMS II**  
(2002 Scheme)

Time: 3 Hours

Maximum Marks: 100

- I. (a) Describe the Gauss-Seidal Algorithm for load flow solution. (10)  
(b) Explain the fast decoupled method for load flow solution. (10)
- OR**
- II. (a) Describe Newton Raphson method for load flow solution. (15)  
(b) Using Newton Raphson method, find the value of  $x$  correct up to 4 decimal places in the equation  $3x - \cos x - 1 = 0$ . (5)
- III. (a) Explain about sudden symmetrical short circuit of alternator. (10)  
(b) Show that the current in neutral to ground connection is three times zero sequence component of current. (10)
- OR**
- IV. (a) Explain: (i) Single line to ground fault (ii) Double line to ground fault  
(iii) Line to line fault (12)  
(b) A 50MVA, 11KV, 3 phase alternator was subjected to different types of fault. The fault currents were: 3 phase fault 1870A, line to line fault 2590A, single line to ground fault 4130A. The alternator neutral is solidly grounded. Find the per unit values of the three sequence reactance of the alternator. (8)
- V. (a) Explain equal area criterion with illustrations. (10)  
(b) Derive swing equation. (10)
- OR**
- VI. (a) Prove that for maximum power transfer  $X = \sqrt{3}R$ . (10)  
(b) Describe the construction and characteristics of HRC fuses. (10)
- VII. (a) With neat circuit diagram, explain the working principle of a vacuum circuit breaker. (10)  
(b) Define: (i) Breaking capacity (ii) Making capacity  
(iii) Short time rating of a circuit breaker. (5)  
(c) A circuit breaker is rated as 1500A, 1000 MVA, 33KV, 3 second, 3 phase oil circuit breaker. Find: (i) Breaking capacity (ii) Rated symmetrical breaking current  
(iii) Rated making current (5)
- OR**
- VIII. (a) With diagram, explain the working of a Buchholz relay. (14)  
(b) Explain the basic principle of induction relays. (6)
- IX. (a) Explain merz price protection scheme for alternators. (10)  
(b) Explain translay scheme for protection of transmission lines. (10)
- OR**
- X. (a) Derive an expression for distance traveled using:  
(i) Trapezoidal speed time curve  
(ii) Quadrilateral speed time curve (12)  
(b) With neat diagram, explain a thyrite type lightning arrester. (8)

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