Total No. of Questions : 8] [Total No. of Printed Pages : 2

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MEPE–203(A)

M. E. (Second Semester) EXAMINATION, June, 2010

POWER ELECTRONICS APPLICATIONS TO POWER SYSTEM

[MEPE–203(A)]

Time : Three Hours

Maximum Marks : 100

Minimum Pass Marks : 40

Note : Attempt any *five* questions. All questions carry equal marks.

1. (a) With a neat flow chart explain the load flow solution by Gauss-Seidel method.
   (b) Explain the principle and method of solution of the load flow problem by Newton-Raphson :
      (i) Rectangular co-ordinates
      (ii) Polar co-ordinates method
2. (a) Explain security in relation to power system operation.
   (b) What is contingency evaluation in connection with power system security ?
3. (a) Discuss in detail about the generation and absorption of reactive power in power system components.
   (b) What is a static compensator ? Explain with diagrams working principle of various types of static compensator.

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4. (a) Explain voltage stability and explain the factors affecting voltage instability and collaple.
   (b) Explain the comparison of angle and voltage stability in brief.
5. (a) What are the various types of FACTS devices ? Explain their working principle.
   (b) The particulars of a transmission line are V = 220 V, F = 60 Hz, X = 12 Ω and P = 56 kW. The particulars of TCSC are S = 80%, C = 20 μ F and L = 0·4 mH. Find :
      (i) Degree of compensation
      (ii) Compensating capacity reactance
      (iii) Line current
6. Explain with neat diagram the operation of basic TCR and derive expression for the control law of the basic TCR and explain the control flow.
7. (a) Write the comparison between STATCOM and SVC and explain them.
   (b) What is the basic principle of series compensation ? Explain in brief with the help of Thyristor Switched Series Capacitor (TSSC).
8. Write short notes on any *three* of the following :
   (i) Decoupled load flow
   (ii) Generator shift distribution factor and line voltage distribution factor
   (iii) PV-curve
   (iv) Load ability of the transmission line
   (v) ●LTC and phase shifting transformer