

**B.Tech Degree VIII Semester Examination, April 2010****EE 802 POWER SYSTEMS III**  
(2006 Scheme)

Time: 3 Hours

Maximum Marks: 100

**PART – A**  
(Answer ALL questions)

(8 x 5 = 40)

- I. (a) For the following circuit breakers give their voltage ranges.
- Air break circuit breaker
  - Air blast circuit breaker
  - Minimum oil circuit breaker
  - Vacuum circuit breaker
  - SF<sub>6</sub> circuit breaker
- (b) Give the necessity of neutral earthing.
- (c) Explain the necessity of biasing in differential protection.
- (d) Write universal relay torque equation. Explain the terms and deduce the expression for Torque for a directional relay.
- (e) Draw speed-time curve for a suburban service train and explain the following.
- Crest speed
  - Average speed
  - Schedule speed
- (f) Explain the basic principle of dielectric heating and give any two applications.
- (g) Give the necessity of energy auditing in power system.
- (h) What are the factors affecting power quality.

**PART – B**

(4 x 15 = 60)

- II. (a) Give any five advantages of SF<sub>6</sub> circuit breakers. (5)
- (b) Explain recovery voltage and restriking voltage. (6)
- (c) Explain why an over head line is terminated near a station by connecting an underground cable of short length. (4)
- OR**
- III. (a) With figure explain thyrite lightning arrester. (10)
- (b) Discuss about arcing ground. (5)
- IV. (a) Suggest one application of directional relay in power system. (5)
- (b) Explain the working and characteristics of mho relay. Also give one application of this relay. (10)
- OR**
- V. (a) With neat figure explain the working of Buchholz relay. (10)
- (b) Give any five advantages of static relays. (5)
- VI. (a) Explain the single phase AC system for traction application. (5)
- (b) A train weighing 120 tonnes is to be driven up an incline of 2 percent at a speed of 36 kmph. If the train resistance at this speed is 2 kg per tonne, find the current required at 1500Vdc. If the efficiency of the motors and gearing is 88 percent, if the current were cut off, how long would the train take to come to rest? (10)
- OR**
- VII. (a) With figures discuss in detail about direct and indirect arc furnaces. (8)
- (b) Discuss the principle and one application of induction heating. (7)
- VIII. (a) Discuss about energy conservation in electric motors. (8)
- (b) Discuss about design of filters in power system. (7)
- OR**
- IX. (a) List out the loads which will produce harmonic currents. (8)
- (b) Discuss about mitigation method. (7)