Code : *1P6223*

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES :: RAJAMPET
(AUTONOMOUS)
M.Tech. II-Semester *Regular Examinations, November 2012*
Advanced Power System protection
(*Common to EPE & EPS*)

Max. Marks: 60   Time: 03 Hours

****

Answer *any five* questions
All Questions carry equal marks (12 Marks each)

1. a. Write the differences between static relays and electromagnetic relays.   [6M]

    b. Derive the General Equation of Amplitude comparator.   [6M]

2. Explain about coincidence type phase comparator with diagram also explain the   [12M]
    method of measurement of period of coincidence.

3. a. What are the various types of static over current relays? Explain their area of   [6M]
    applications.

    b. The current rating of an over current relay is 5 A. PSM=2, TMS= 0.3, CT ratio=   [6M]
    400/5. Fault current= 4000 A. Determine the operating time of relay. At TMS= 1,
    operating time at various PSM are:

PSM	2	4	5	8	10	20
operating time (sec)	10	5	4	3	2.8	2.4

4. Explain the principle and operation of static impedance relay with circuit diagram.   [12M]

5. a. Explain the Coinc-section characteristics of Three input amplitude Comparator.   [6M]

    b. What are the switched distance relaying schemes. Describe them in brief.   [6M]

6. Explain the effect of power swings on the performance of distance relays.   [12M]

7. Draw the basic block schematic diagram of interface for directional relay and also   [12M]
    draw the flow chart for the microprocessor based directional relay

8. Explain the microprocessor implementation of digital distance relaying algorithm   [12M]
    and draw its schematic diagram.

@@@

Code : *1P7221*

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES :: RAJAMPET
(AUTONOMOUS)
M.Tech. II-Semester *Regular Examinations, November 2012*

DISTRIBUTED GENERATION
(EPS)

Max. Marks: 60   Time: 03 Hours

****
Answer *any five* questions
All Questions carry equal marks (12 Marks each)

1.	a.	List out different dispersed generation systems and explain any of them?	6M
	b.	How the operations of DGs are carried? Explain.	6M
2.	a.	What is solar cell? Explain its principle of operation.	6M
	b.	What are the applications of super conducting materials? Explain.	6M
3.	a.	What is the principle of MHD power generation? Explain.	6M
	b.	Discuss MHD technology in detail.	6M
4.	a.	Explain the basic principle of wind energy conversion with equations.	6M
	b.	What are the different types of wind turbines? Explain any one.	6M
5.	a.	Name a few tidal projects harnessing tidal power and explain any one.	6M
	b.	Describe with a neat sketch about construction and principle of a turbine used for tidal power.	6M
6.	a.	What are the methods of ocean thermal electric power generation? Explain any one.	6M
	b.	What is meant by coal gasification and liquification? Explain.	6M
7.	a.	What are the types of fuel cells? Describe any one.	6M
	b.	Describe co-generation and energy storage.	6M
8.	a.	Explain the applications of fuel cells and batteries.	6M
	b.	Describe the environmental effects of co-generation and energy storage.	6M

(0)

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES :: RAJAMPET
(AUTONOMOUS)
M.Tech. II-Semester *Regular Examinations, November 2012*
Electrical Power Distribution & Automation
(*Common to EPE & EPS*)

Max. Marks: 60   Time: 03 Hours
****
Answer *any five* questions
All Questions carry equal marks (12 Marks each)

1. a. Define load factor and loss factor. And also derive the relation between load factor and   6M
      loss factor.

   b. How the loads are grouped? Write short notes on the load modeling and explain the   6M
      characteristics.

2. a. Make a comparison between DC vs AC distribution system and underground vs overhead   6M
      distribution system.

   b. Briefly explain ring main distributor with neat diagram.   6M

3. a. Explain the basic design practice of secondary distribution system.   6M

   b. Consider the three-phase three-wire 240 v secondary system with balanced loads at A, B,   6M
      and C as shown in fig.1 Determine the following:

      (a) Calculate the reactive power per phase for each load.

      (b) Calculate the kilo volt ampere output and load power factor of the distribution
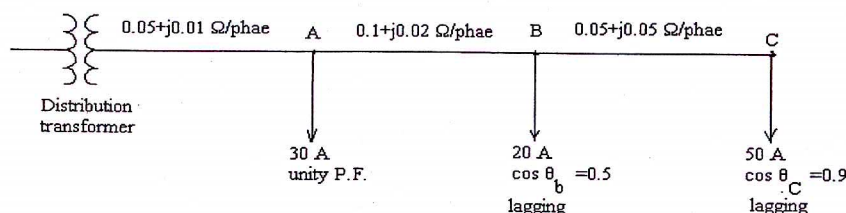   transformer.

Fig. 1

4. a. Explain the various methods for voltage control.   6M

   b. A synchronous motor improves the power factor of a load of 250 kW from 0.8 lagging to   6M
      0.9 lagging, simultaneously the motor carries a load of 100 kW. Determine: (i) the leading
      kVAR taken by the motor (ii) kVA rating of the motor (iii) power factor at which the
      motor operates.

5. a. Explain the difference between fuse and circuit breaker, mentioning the advantages of   6M
      each of them.

   b. What are the types of common faults that occur in a distribution system? Explain them   6M
      with proper line diagram.

6. a. Explain the basic architectures and implementation strategies for distribution automation.   8M

   b. What are the objectives of distribution automation?   4M

7. a. Write short notes on operation environment of distribution networks.   6M

   b. Explain the functions of distribution management systems.   6M

8. a. Write short notes on voltage/VAR control   6M

   b. Write short notes on reconfiguration of distribution systems   6M

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES :: RAJAMPET
(AUTONOMOUS)
M.Tech. II-Semester *Regular Examinations, November 2012*
Energy Auditing, Conservation & Management
(*Common to EPE & EPS*)

Max. Marks: 60   **Time: 03 Hours**

****
Answer *any five* questions
All Questions carry equal marks (12 Marks each)

1. a. Explain step wise procedure to carryout detailed energy audit   6M
   b. Explain the following techniques with their use for energy analysis: 6M
      (i) Sankey diagram (ii)load profiles

2. a. What are the various steps involved in the implementation of energy management in an organization?   6M
   b. Explain the importance of energy management programs in industries to improve energy utilization   6M

3. a. What are the managerial functions involved in energy management? Explain in detail   6M
   b. Explain the duties of energy manager   6M

4. a. Explain the constructional features of energy efficient motors taking into consideration of loss distribution   6M
   b. Discuss the effect of the following on efficiency of a given motor   6M
      (i) variable duty cycle systems (ii) voltage unbalance

5. a. In general the location of capacitors will be at load side rather than supply side, explain.   6M
   b. Explain the effects of harmonics on power factor   6M

6. Explain the working of the following instruments   12M
   (i) Data logger (ii) lux meter (iii) thermocouple

7. a. What is time value of money and rate of return concepts?   6M
   b. Explain replacement analysis   6M

8. a. Explain the following financial analysis techniques with advantages and disadvantages   6M
      (i) Simple pay back method (ii) Net present worth method
   b. The maximum demand of a factory is 3000KVA at a power factor of 0.7 lagging and tariff is Rs 60/annum/KVA of maximum demand. Determine the KVAR rating of capacitors which would result in maximum economy if the capital cost is Rs 100/KVAR and interest charges are at the rate of 10% per annum. What would be annual saving in electrical charges when the capacitors are installed?   6M

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES :: RAJAMPET
(AUTONOMOUS)
M.Tech. II-Semester *Regular Examinations, November 2012*
FLEXIBLE AC TRANSMISSION SYSTEMS
(common to EPE and EPS)

Max. Marks: 60   Time: 03 Hours

****
Answer *any five* questions
All Questions carry equal marks (12 Marks each)

1. a. Explain the basic types of FACTS Controllers

   b. Explain various benefits from the FACTS Controllers

2. a. Explain the concept of single phase full wave voltage sourced converter with necessary waveforms and also explain relation ship between current and voltage

   b. Explain the operation of single phase leg (Pole) operation with circuit diagram

3. a. Explain the concept of Fundamental and Harmonic voltages for a Three-Level Voltage Sourced Converters.

   b. Explain the operation of Pulse Width Modulation (PWM) Converter.

4. Explain the objectives of Shunt Compensation.

5. a. Explain the operation of TCR and TSR with their characteristics.

   b. Explain how the TCR and TSR can eliminate the harmonics in the system.

6. Explain the comparison between STATCOM and SVC.

7. How the series compensators are used for improvement of transient stability and power oscillation damping? Explain.

8. Explain the operation of TCSC with its characteristics

@@@

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES :: RAJAMPET
(AUTONOMOUS)
M.Tech. II-Semester *Regular Examinations, November 2012*
OPERATION & CONTROL OF POWER SYSTEM
(Common to EPE and EPS)

Max. Marks: 60

Time: 03 Hours

****

Answer *any five* questions
All Questions carry equal marks (12 Marks each)

1.	Discuss load dispatch problem using gradient and Newton's methods.	12 M
2.	Explain Dynamic programming solution of unit commitment problem with flow chart.	12M
3.	Discuss and derive mathematical formulation of Hydro-thermal system.	12M
4.	Discuss static and dynamic response of two area controlled system.	12M
5. a.	Explain briefly the basic concepts LFC.	6M
b.	Discuss flat frequency control of EDC.	6M
6.	Discuss (a) Inter utility energy evaluation (b) Transmission effects in inter change of power.	12M
7.	Discuss basic concepts of power system security.	12M
8.	Discuss state estimation of power systems using Weighted LSE with example.	12M

@@@