

Code : 1P6221

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES :: RAJAMPET
(AUTONOMOUS)*M.Tech. II Semester Regular Examinations, December 2013***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. Explain (i) Load forecasting and (ii) Unit commitment problem. 12 M
2. a. Explain various constraints in unit commitment problem. 6M
b. Discuss priority-List methods. 6M
3. Discuss short term hydrothermal scheduling problem. 12M
4. Discuss tie-line bias control of EDC. 12M
5. Discuss static and dynamic response of two area uncontrolled system. 12M
6. Explain (i) contingency analysis and (ii) Bus incremental costs, with regard to power system security. 12M
7. Discuss various factors affecting the economic interchange between interconnected utilities. 12M
8. Discuss orthogonal decomposition estimation method. 12M

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ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES :: RAJAMPET
(AUTONOMOUS)

M.Tech II Semester Regular December, 2013

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. What are the merits and demerits of static relays. [6M]
b. Explain the duality between amplitude comparator and phase comparator [6M]
2. Explain about circulating current type rectifier bridge amplitude comparator with diagram. [12M]
3. Explain the principle and operation of static over current relay and Inverse definite time over current relays [12M]
4. a. Explain the static differential protection transformer. [4M]
b. Explain the realization of the MHO relay with sampling comparator [8M]
5. Explain the phase fault compensation with circuit diagram. [12M]
6. Briefly explain the power swing analysis with characteristics. [12M]
7. Draw the flow chart of the microprocessor based reactance relay. [12M]
8. a. Explain the procedure for the measurement of resistance in distance relays. [4M]
b. Draw the flow chart for the microprocessor offset mho relay [8M]

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Max. Marks: 60

Time: 03 Hours

Answer any five questions

All Questions carry equal marks (12 Marks each)

1. a. Define and explain coincidence factor, contribution factor and loss factor. 6M
- b. How the loads are classified? And explain the types of loads and their characteristics. 6M
2. a. Write down the requirements and design features of distribution system. 6M
- b. Write short notes on ring main distributor. 6M
3. a. Write down the factors that affect the primary feeder loading and also feeder voltage levels. 6M
- b. Consider the three-phase three-wire 240 v secondary system with balanced loads at A, B, and C as shown in fig.1 Determine the following: 6M

(a) Calculate the total voltage drop

(b) Calculate the real power per phase for each load

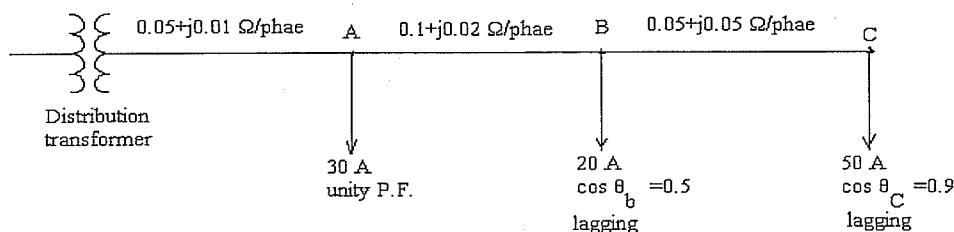


Fig. 1

4. a. What are the causes for low power factor? Explain the various methods to improve the power factor. 6M
- b. A 3 - phase, 5 kW induction motor has a power factor of 0.85 lagging. A bank of capacitor is connected in delta across the supply terminal and power factor raised to 0.95 lagging. Determine the kVAR rating of the capacitor in each phase. 6M
5. a. What are the main objectives of distribution system protection? Discuss. 4M
- b. Explain the principle of operation of fuse. 4M
- c. Considering a typical example, describe the procedure for fault current calculations in a distribution system, mentioning the assumptions to be made for the analysis. 4M
6. a. Explain the necessity of distribution automation. 4M
- b. Explain in detail the distribution automation system. 8M
7. a. Write short notes on outage management. 6M
- b. Write down the decision support applications of management systems. 6M
8. a. Write short notes on Demand side management 6M
- b. Write short notes on Power quality 6M

**ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES :: RAJAMPET
(AUTONOMOUS)**

M.Tech. II Semester Regular Examinations, December 2013

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)

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| 1. a. | Explain various energy conservation schemes. | 6M |
| | b. Explain about energy audit of buildings. What are the benefits of this audit? | 6M |
| 2. a. | Explain energy management term and general structure of energy management | 6M |
| | b. What are the managerial functions involved in energy management? | 6M |
| 3. a. | Explain about the qualities and functions of energy manager | 6M |
| | b. Explain about the check list for top management | 6M |
| 4. a. | What are the factors that affect efficiency of a given motor? Discuss in detail | 6M |
| | b. Discuss motor energy audit in a processing industry | 6M |
| 5. a. | Explain the effect of nonlinear loads on power factor | 6M |
| | b. Discuss lighting energy audit | 6M |
| 6. a. | Discuss the applications of programmable logic controllers in energy measurement | 6M |
| | b. Explain the principle and working of a pyrometer | 6M |
| 7. a. | Explain the economic analysis and depreciation methods in energy auditing | 6M |
| | b. A 40 hp motor having an efficiency of 92% is replaced with an energy efficient motor of same rating of efficiency 94.5%. If the motor works for 400 hours at power cost of Rs 5.0/kWh, find the pay back period if the old motor costs Rs 70,000/- and the new motor cost is Rs 100,000/-. Find the saving by net present worth method over a period of 10 years if rate of return is 10%, power rate increase 8% and tax rate is 40%. | 6M |
| 8. a. | What are the objectives of carrying out life cycle costing analysis? | 6M |
| | b. Calculate simple payback period and percentage Return on Investment(% ROI) for a project that cost Rs.60 lakhs and Rs.5 lakhs per year on an average to maintain and operate and is expected to save annually Rs.20 lakhs. Comment on ROI whether to implement the project or not. | 6M |

Code : 1P6224

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES :: RAJAMPET
(AUTONOMOUS)

M.Tech II Semester Regular December, 2013

Energy Conversion Systems
(EPE)

Max. Marks: 60

Time: 03 Hours

Answer *any five* questions

All Questions carry equal marks (12 Marks each)

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|-------|---|-----|
| 1. a. | Draw the six configurations a solar cell. | 6M |
| b. | Explain some of the applications of superconducting materials in electrical equipment and systems. | 6M |
| 2. a. | Explain the Principles of MHD power generation. | 6M |
| b. | Explain the practical MHD generator performance | 6M |
| 3. a. | Derive the expression for power developed due to wind | 6M |
| b. | Explain the different types of wind turbines | 6M |
| 4. a. | Draw the diagrams of seven types of wave energy conversion schemes | 6M |
| b. | What are the applications of OTEC systems | 6M |
| 5. a. | Explain the process of coal liquefaction | 6M |
| b. | Explain various types of fuel cells | 6M |
| 6. a. | Describe the co-generation system using a topping cycle and a bottoming cycle | 6M |
| b. | Explain any three energy storage systems | 6M |
| 7. | Explain the working of a lead-acid battery and discuss its charging and discharging characteristics | 12M |
| 8. a. | Explain various preventive measures to control the pollution from coal. | 6M |
| b. | Write short notes on Steam station and pollution | 6M |

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ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES :: RAJAMPET
(AUTONOMOUS)

M.Tech II Semester Regular December, 2013
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 concept of power flow in parallel paths and meshed systems
b. Explain the loading capability limits
2. a. Explain the transformer connections for 12-Pulse operation
b. Explain the transformer connections for 48-Pulse operation
3. Explain the comparison of Current Sourced and Voltage Sourced Converters.
4. How the shunt compensators are used for improvement of transient stability and power oscillation damping? Explain.
5. a. Explain the basic operation of rotating synchronous compensator.
b. Explain different types of Hybrid VAR generators with their characteristics.
6. a. Explain the concept of Regulation Slope
b. Explain the dynamic performance of the compensator using basic transfer function block diagram.
7. Explain various objectives of series capacitive compensation
8. Explain the basic control schemes for GSC, TSSC and TCSC using block diagrams.

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