# DRONACHARYA COLLEGE OF ENGINEERING

KHENTAWAS, FARRUKHNAGAR, GURGAON, HR

Department: EEE

Academic Session: 2020-2021(MAY- AUG, 2021)

Lecture Plan with Assignment questions

Subject with code: Power System Protection (PCC-EE-06-G)

Name of Faculty with designation : Ms. Pooja Sharma , Assistant Professor

| S.No. | Month | Date & Day | Sem-Class | Unit | Topic/Chapter covered | Reference Books | Write Lecture Wise Questions |
|---|---|---|---|---|---|---|---|
| 1 | | | VI-EEE | A | Introduction and Components of a Protection System Principles of Power System Protection | **J. L. Blackburn, "Protective Relaying: Principles and Applications", Marcel Dekker, New York, 1987.** | Q.1.Define Pick up value.<br>Q.2.Define reset value. |
| 2 | | | VI-EEE | A | Relays, Instrument transformers | | Q.1.Discuss principle of arc interruption in an OCB<br>Q.2.Discuss principle of arc interruption in an ABCB |
| 3 | | | VI-EEE | A | Circuit Breakers , Generator Protection: External and internal faults | | Q.1.Define operating time.<br>Q.2.Define reset time. |
| 4 | | | VI-EEE | A | Differential protection – biased circulating current protection | | Q.1.Write short note on 3 zone protection.<br>Q.2.Write short note on Impedance relay. |
| 5 | | | VI-EEE | A | Self balance system | | Q.1.What is open conductor fault?<br>Q.2.Compare neutral, ground and earthing. |
| 6 | | | VI-EEE | A | Over-current and earth fault protection | | Q.1.Classify various types of over current relays.<br>Q.2.Give their application along with approximate characteristics. |
| 7 | | | VI-EEE | A | Protection against failure of excitation | | Q.1.What are different ratings of circuit breakers?<br>Q.2.Compare vacuum and DC circuit breakers. |
| 8 | | | VI-EEE | B | Faults and Over-Current Protection Review of Fault Analysis | **Y. G.Paithankar and S. R. Bhide, "Fundamentals of power system protection", Prentice Hall, India, 2010.** | Q.1.Explain the classifications of relays.<br>Q.2.What are the different nature and causes of faults? |
| 9 | | | VI-EEE | B | Sequence Networks | | Q.1.Discuss the phenomenon of current chopping.<br>Q.2.What are the advantages and disadvantages of using air as an arc quenching medium? |
| 10 | | | VI-EEE | B | Introduction to Overcurrent Protection | | Q.1.Describe combined leakage and overload protection of transformer.<br>Q.2.Explain energy balance theory. |
| 11 | | | VI-EEE | B | Introduction to overcurrent relay co-ordination. | | Q.1.Define pick up value and plug setting multiplier.<br>Q.2.Write a note on 'Zones of infection'. |
| 12 | | | VI-EEE | B | Transformer protection: Differential protection – self-balance system of protection | | Q.1.Explain transformer protection in detail.<br>Q.2.How many types of X'mers cores are available? What type of protections are needed? |
| 13 | | | VI-EEE | B | Overcurrent and earth fault protection | | Q.1.Discuss the phenomenon of resistance switching.<br>Q.2.Derive the equation of torque developed in an induction relay. |
| 14 | | | VI-EEE | B | Buchholz' s relay and its operation. | | Q.1.Differentiate primary and back up protection.<br>Q.2.What is the role of back up protection? |
| 15 | | | VI-EEE | C | Equipment Protection Schemes:- Directional protection | **A. G. Phadke and J. S. Thorp, "Computer Relaying for Power Systems", John Wiley & Sons, 1988.** | Q.1.Draw circuits of directional relays.<br>Q.2.Describe operating principle and area of application of directional overcurrent relay. |
| 16 | | | VI-EEE | C | Distance protection | | Q.1.Draw circuits of distance relays.<br>Q.2.What are the various methods of providing back up protection? |
| 17 | | | VI-EEE | C | Differential protection | | Q.1.Draw circuits of differential relays.<br>Q.2.Describe differential pilot wire method of protection of feeders. |
| 18 | | | VI-EEE | C | Bus bar Protection, Bus Bar arrangement schemes. | | Q.1.What are motor and bus zone protection?<br>Q.2.Compare pilot wire and carrier current protection. |
| 19 | | | VI-EEE | C | Modeling and Simulation of Protection Schemes CT/PT modeling and standards | | Q.1.Write short note on classification of static relays.<br>Q.2.Write short note on relaying schemes based on microwave. |
| 20 | | | VI-EEE | C | Simulation of transients using Electro-Magnetic Transients (EMT) programs | | Q.1.Explain optical fiber link based relaying schemes.<br>Q.2.Compare digital and conventional relay technique in detail. |
| 21 | | | VI-EEE | C | Relay Testing. | | Q.1.Define static relay.<br>Q.2.Explain its construction & working and also differentiate it with electromechanical relays. |
| 22 | | | VI-EEE | D | Effect of Power Swings on Distance Relaying | **A. G. Phadke and J. S. Thorp, "Synchronized Phasor Measurements and their Applications", Springer, 2008.** | Q.1.Describe any one type of overcurrent relay.<br>Q.2.Explain principle of operation of impedance type distance relay. |
| 23 | | | VI-EEE | D | System Protection Schemes. | | Q.1.Explain numerical protection scheme in detail.<br>Q.2.Explain its application also. |
| 24 | | | VI-EEE | D | Under-frequency, under-voltage and df/dt relays, | | Q.1.Compare the working of block spike and block average comparators.<br>Q.2.What are digital relays? |
| 25 | | | VI-EEE | D | Out-of-step protection, Synchro-phasors, Phasor Measurement | | Q.1.How digital relays are different from analog relays?<br>Q.2.What are the applications of microprocessor in the field of power system protection? |
| 26 | | | VI-EEE | D | Units and Wide-Area Measurement Systems (WAMS). | | Q.1.Explain any one type of relaying scheme based on microprocessor.<br>Q.2.Explain rectifier type relays with neat sketch. |
| 27 | | | VI-EEE | D | Application of WAMS for improving protection systems. | | Q.1.Explain travelling wave relay.<br>Q.2.Discuss about phase and amplitude comparators in detail. |
| 28 | | | VI-EEE | | Revision | | |
| 29 | | | VI-EEE | | Revision | | |
| 30 | | | VI-EEE | | Last year question paper discussion | | |