



--	--	--	--	--	--	--	--	--	--

P.E.S. College of Engineering, Mandya - 571 401
(An Autonomous Institution affiliated to VTU, Belgaum)
Sixth Semester, B.E. - Electrical and Electronics Engineering
Semester End Examination; June/July - 2015
Switch Gear and Protection

Time: 3 hrs

Max. Marks: 100

Note: Answer any FIVE full questions, selecting at least TWO full questions from each part.

PART - A

1. a. Explain the cut-off characteristics of HRC fuse. 6
- b. Explain the formation of Arc and Initiation of Arc. 6
- c. Explain briefly high Resistance Arc interruption methods. 8
2. a. Derive the expression for restriking voltage and RRRV in terms of system voltage, inductance voltage and capacitance. 8
- b. Explain the phenomenon of current chopping in a circuit breaker. 6
- c. In a 132 kV system, the inductance and capacitance per phase upto the location of circuit breaker is 5Ω and capacitance to earth is $0.02 \mu\text{F}$ respectively. A resistance of 500Ω is connected across the contacts of the circuit breaker. Determine the natural frequency of Oscillation damped frequency of Oscillation and critical resistance. 6
3. a. Explain with the help of neat sketch the construction and working principle of minimum oil circuit breaker. 10
- b. Explain the construction and operation of Air blast circuit breaker and mention its advantages and disadvantages. 10
4. a. Explain the operation of non puffer type SF_6 breaker. 8
- b. Explain the Arc interruption taking place in vacuum circuit breaker. 6
- c. Write a short note on synthetic testing. 6

PART - B

5. a. Discuss the essential qualities of protective Relay. 6
- b. Explain with the help of a neat diagram, the construction and working of a non directional Induction type over current relay. 8
- c. Explain the working principle and operating characteristics of a percentage differential relay. 6
6. a. Explain the operation of Impedance relay and show the operating characteristics on R-X diagram. 8
- b. Explain the construction and working of Buchholz relay. 6
- c. Explain the three stepped distance protection of transmission lines. 6

- 7 a. Explain various types of faults which can occur in a generator. 10
- b. Explain the Merz-price protection of alternator stator winding in case of delta connected system. 10
- 8 a. Explain problems which are encountered in differential protection of a transformer. 6
- b. Discuss the various possible faults in a transformer. 8
- c. Explain the ground fault protection in case of induction motor. 6

* * * * *