Code No. 2372 / N

FACULTY OF ENGINEERING

B.E. 3/4 (EEE) II – Semester (New) (Main) Examination, May 2013

Subject : Switch Gear and Protection

Time : 3 hours **Max. Marks : 75**

Note: Answer all questions from Part-A. Answer any FIVE questions from Part-B.

PART – A (25 Marks)

1. Define :
   i) Pick-up value ii) Operating time and iii) Setting value of a protective relay 3
2. Write the advantages of static relays over electromagnetic relays. 2
3. Explain the operating principle of an impedance relay. 3
4. Draw the simplified block diagram of static inverse time over current relay. 2
5. With a neat sketch, write the working principle of transverse protection of alternator. 3
6. What is magnetizing inrush current? 2
7. In a 132 KV system, the inductance and capacitance upto the location of circuit breaker are 0.4 H and 0.015 μF respectively. Determine the maximum rule of the restriking voltage across the contacts of the circuit breaker and maximum value of RRRV. 3
8. What is resistance switching? 2
9. Write the causes of over voltages. 2
10. Compare the time-current characteristics of inverse, very inverse and extremely inverse current relays. 3

PART – B (50 Marks)

11.a) With a neat diagram, explain the protective scheme for ringmain system. 5

b) Derive the equation for the Torque developed by induction type relay. 5

12. Explain stepped time-distance characteristics of three distance relays units used for I, II and III zone protection. 10

13.a) With a neat diagram explain the percentage differential protection scheme of protection of stator of alternator. 5

b) What is magnetizing inrush currents? Discuss the protective scheme which protects the transformer against faults but does not operate incase of magnetizing inrush current. 5

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14.a) Explain how arc is initiated and sustained in a circuit breaker when the circuit breaker contacts separate. 5

b) Discuss two methods of arc interruption in circuit breakers. 5

15.a) What is ground wire? How do ground wires protect the overhead lines against direct lightening strokes? 5

b) Describe the construction and principle of operation of value type lightening arrestor. 5

16.a) Derive an expression for restriking voltage and rate of rise of restriking voltage of a circuit breaker. 7

b) Why IDMT relays are widely used for over current protection? 3

17. Write short notes on :
a) Buchholz relay and
b) Rating of circuit breakers

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