Reg. No. :

Question Paper Code: 41355

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2016

Fifth Semester

Electrical and Electronics Engineering

14UEE505 - PROTECTION AND SWITCH GEAR

(Regulation 2014)

Duration: Three hours   Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. The over-voltage surges in power systems may be caused by

   (a) Lightning   (b) Switching
   (c) Resonance   (d) Any of the above

2. The plug setting of a negative sequence relay is 0.2 A. The current transformer ratio is 5:
   1. The minimum value of line to line fault current for the operation of the relay is

   (a) 1a   (b) 1/ 1.732 A
   (c) 1.732 A   (d) 0.2 / 1.732 A

3. Directional relay are based on flow of

   (a) Power   (b) Current
   (c) Voltage   (d) None of the above

4. A differential relay measures the vector difference between

   (a) Two current
   (b) Two voltage
   (c) Two or more similar electrical quantities
   (d) None of the above

5. A Merz-price protection is suitable for

   (a) Transformers   (b) Alternators
   (c) Feeders   (d) Transmission lines

6. A 250: 5, current transformer is used along with an ammeter. If ammeter reading is 2.7A, estimate the line current.

    (a) 135A   (b) 140A   (c) 138A   (d) 145A

7. For which of the following protection from negative sequence current is provided?

    (a) Generator   (b) Motors
    (c) Transmission line   (d) Transformer

8. Moving parts are absent in

    (a) Static relay   (b) Electromagnetic relay
    (c) Induction type relay   (d) Alternator

9. For extra high voltage lines which circuit breaker is preferred?

    (a) Bulk oil circuit breaker   (b) Vacuum circuit breaker
    (c) SF6 gas circuit breaker   (d) Minimum oil circuit breaker

10. The voltage appearing across the contacts after opening of the circuit breaker is called

    (a) Recovery voltage   (b) Surge voltage
    (c) Operating voltage   (d) Arc voltage

PART - B (5 x 2 = 10 Marks)

11. What do you mean by Pickup current.

12. List out the different types of distance relay.

13. What are the various faults that would affect an alternator?

14. Compare static two electromagnetic relay.

15. Enumerate the breaking capacity of circuit breaker.

PART - C (5 x 16 = 80 Marks)

16. (a) Discuss and compare the various methods of neutral earthing.   (16)

Or

    (b) (i)   Describe the essential qualities of a protection relay.   (8)

         (ii) Explain the overlapping of protective zones with neat sketch.   (8)

17. (a) Describe the operating principle and constructional features of directional relay. How do you implement directional features in the over current relay?   (16)

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(b) (i) What are different inverse time characteristics of over circuit relay? Explain in briefly. (8)

(ii) Explain a reactance relay showing its characteristics of R-X diagram. (8)

18. (a) (i) Explain the factors causing difficulty in applying Merz-price circulating current principle to a potential transformer and how are they overcome.

(8)

(ii) Differentiate between current and potential transformer. (8)

Or

(b) Briefly explain the various types of stator fault protection of alternator. (16)

19. (a) (i) Mention the advantages and limitations of static relay. (8)

(ii) Discuss the operation of numerical differential protection scheme used for the transformers. (8)

Or

(b) (i) Draw and explain the block diagram of static relay. (8)

(ii) Mention the advantages and limitations of Numerical relay. (8)

20. (a) Explain the construction, operating principle and application of minimum oil circuit breaker. (16)

Or

(b) Describe the construction , operating principle and application of a SF6 circuit breaker. (16)

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