Reg. No. : | | | | | | | | | | |

Question Paper Code: 45305

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2018

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. Switchgear is an apparatus

   (a) Used for switching, controlling and protecting the electrical circuits and equipments
   (b) It detects the faults only
   (c) It corrects the faults only
   (d) all the above

2. For symmetrical network, the neutral current is

   (a) Zero (b) infinity (c) Maximum (d) None of these

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 large size alternator is protected against overloads by providing

(a) over current relay (b) Temperature sensitive relay
(c) Thermal relay (d) None of these

7. Which of the following circuit breakers has the lowest operating voltage?

(a) SF_6 circuit breaker (b) Air break
(c) Air blast (d) Minimum oil circuit breaker

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. What type of circuit breaker is preferred to be installed in extra high voltage AC system?

(a) Bulk oil type circuit breaker (b) Air blast circuit breaker
(c) SF_6 circuit breaker (d) Vacuum circuit breaker

PART - B (5 x 2 = 10 Marks)

11. Why earth wire is provided in over head lines?

12. Where is negative phase sequence relay employed?

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

14. Describe the function of isolating switch.

15. What do you meant by insulation coordination?

PART - C (5 x 16 = 80 Marks)

16. (a) (i) Explain the necessity to protect the transmission lines and other equipment of the power system against over voltages. (8)

(ii) Draw the single line diagram of a modern power system. Discuss various zones of protection for a modern power system. (8)

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) Explain the general working of a relay and derive the fundamental torque equation (16)

Or

(b) (i) Describe the construction details and principle of operation of directional power relay. (8)

(ii) Derive and explain universal torque equation. (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) List and explain the different protective scheme applied for bus bar protection. (16)

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 vaccum circuit breaker. For what voltage range it is recommended? (16)

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45305