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

Question Paper Code: 45305

B.E. / B.Tech. DEGREE EXAMINATION, MAY 2022

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. The operating time for a high speed relay is

   (a) 1 sec (b) 1 milli sec (c) 1 to 2 cycles (d) 10 to 15 cycles

4. In distance relay the operation depends upon

   (a) voltage (b) current
   (c) Fault voltage to current ratio (d) All the above

5. Which section of a power system generally suffers from more faults as compared to the remaining?

   (a) Generators (b) Transformers
   (c) To Transmission lines (d) Underground cables

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. Protective relays can be designed to respond to _____

(a) Light intensity, impedance (b) Temperature, resistance, reactanc
(c) Voltage and current (d) All of these

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. Why earth wire is provided in over head lines?

12. Where is negative phase sequence relay employed?

13. Why secondary of CT should not be kept open?

14. List the drawbacks of static relays.

15. What are the problem associated with DC circuit breaking?

PART - C (5 x 16 = 80 Marks)

16. (a) (i) Explain arc suppression coil in detail. (8)

(ii) Discuss about nature and causes of faults. (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) Write short note on (i) Modified impedance relay and (ii) Reactance relay. (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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