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

Question Paper Code: 31535

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

Fifth Semester

Electrical and Electronics Engineering

01UEE505 - PROTECTION AND SWITCHGEAR

(Regulation 2013)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 2 = 20 Marks)

1. What is the need for protection zones in the system?
2. Give the consequences of short circuit.
3. Write the two applications of differential relay.
4. Define resetting time of a relay.
5. Why neutral resistor is added between neutral and earth of an alternator?
6. What are the causes of over speed and how alternators are protected from it?
7. List the characteristics of numerical protection.
8. Give the significance of static relay.
9. List the demerits of MOCB.
10. Give the significance characteristics of SF_6 gas.

PART - B (5 x 16 = 80 Marks)

11. (a) (i) With neat sketch explain primary and back-up protection. What are the various methods of providing back-up protection? (8)

(ii) Explain the disadvantages and applications of solid grounding system. (8)

Or

(b) (i) How to perform addition of symmetrical components using sequence operator? Explain with equations. (8)

(ii) What are the types of faults occur in power system? And brief about their causes. (8)

12. (a) (i) Explain with the help of neat diagram the construction and working of induction type directional power relay. (8)

(ii) Derive the equation for torque developed in an induction relay. (8)

Or

(b) Explain the principles of distance relays stating clearly the difference between impedance relay, reactance relay and mho relay. Indicate the difference on R-X diagrams and show where each type is suitable. (16)

13. (a) (i) Discuss with a neat electrical diagram the percentage differential relay used for the protection scheme, and explain how the current transformers are connected? (10)

(ii) A three phase 66/11 *kV* power transformer is connected in star/delta. The transformer is protected by merz –price circulating current system. Protecting current transformer on the low voltage side has a ratio of 250/5. Find the ratio of current transformers on high voltage side. (6)

Or

(b) Elucidate the principle of pilot-wire relaying schemes for protection of transmission lines. List out its merits and demerits. (16)

14. (a) (i) Draw the typical architecture of numeric relay and explain their modules function. (8)

(ii) Write the algorithm for development cycle of a new numerical relay. (8)

Or

(b) With a neat flow chart explain the function of numerical over current protection. (16)

15. (a) (i) Write the two factors at which responsible for maintenance of arc between the two contacts and explain principles of arc extinction. (6)

(ii) Compare high resistance and low resistance arc extinction methods used in circuit breaker. (10)

Or

(b) (i) Circuit breaker rated 1500*A*, 1000*MVA*, 33*kV*, 3*sec*, 3*phase* oil circuit breaker. Find rated normal current, breaking capacity, rated symmetrical current, rated making current, short time rating and rated service voltage. (10)

(ii) Converse the recovery rate theory and energy balance theory of arc interruption in a circuit breaker with neat characteristic curves. (6)

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