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Question Paper Code : 11297

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2026.

Sixth Semester

Electrical and Electronics Engineering

EE3601 — PROTECTION AND SWITCHGEAR

(Regulations 2021)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — ($10 \times 2 = 20$ marks)

1. List the various causes of faults in power system.
2. Mention the different types of protective scheme in power system.
3. Mention the functions of electromagnetic relays.
4. Differentiate directional and non-directional relay.
5. The secondary side of the current transformer is always short circuited. Justify.
6. List the various protection schemes available for a motor.
7. State the advantages of numerical relays.
8. Differentiate amplitude and phase comparators.
9. Define re-striking voltage.
10. Why is current interruption easier in an AC circuit than in a DC circuit?

PART B — ($5 \times 13 = 65$ marks)

11. (a) Discuss the various protective schemes employed in power system and also mention the essential qualities of protection.

Or

- (b) Explain in detail about the need and different methods for neutral grounding with suitable diagram.

12. (a) Explain the MHO relay characteristic on the R-X diagram. Discuss the range setting of various distance relays placed on a particular location.

Or

- (b) Describe the principle of percentage biased differential relay with necessary diagrams. Also discuss its applications.

13. (a) Describe the types of protective schemes employed for the protection of bus bar with the neat diagram.

Or

- (b) Explain the types of protective schemes employed for the protection of transmission line with the neat sketch.

14. (a) Discuss the construction, working principle and operation of static over current relay.

Or

- (b) Discuss with neat block diagram of different methods of numerical distance protection of transmission line.

15. (a) Define re-striking voltage and derive the expression for rate of rise of restriking voltage in circuit breaker.

Or

- (b) Describe the constructional details of SF₆ circuit breaker and its operation also mention its advantages and disadvantages.

PART C — (1 × 15 = 15 marks)

16. (a) A star connected 3-phase, 20 MVA, 11 KV Alternator has a per phase reactance of 0.75 ohms/phase. It is protected by Merz price circulating current principle which is to operate for fault currents not less than 175 A. Formulate the value of earthing resistance to be provided in order to ensure only 10% of the alternator winding remains unprotected?

Or

- (b) Determine the inductance of Peterson coil to be connected between the neutral and ground to neutralize having the line to ground capacitance of 0.15 μF. If the supply frequency is 50 HZ and the operating voltage is 132 KV. Find the KVA rating of the coil the charging head of overhead line.