

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
FIRST SEMESTER M. TECH DEGREE EXAMINATION

E

Electrical and Electronics Engineering

(Power Systems)

04EE 6411—Advanced Relaying and Protection

Max. Marks : 60

Duration: 3 Hours

PART A

Answer All Questions

Each question carries 3 marks

1. What do you mean by zone of protection of a relay.
2. What are the advantages of static relays over electromagnetic relays.
3. Determine the plug setting multiplier of a 5 A, 2.2 sec overcurrent relay having a plug setting of 200%. The supply CT is rated 400:5 A and the fault current is 12000 A.
4. Explain thermal image technique.
5. What is circulating current principle?
6. What are antialiasing filters?
7. What are the precautions that must be followed in automatic reclosing.
8. Explain the principle of out of step tripping relay.

PART B

Each question carries 6 marks

9. Draw the phasor diagram of potential transformer and derive the expression for ratio error and phase angle error.

OR

10. A 1000/5, 50 Hz bar primary type current transformer has secondary burden of 1.5Ω (non-inductive). Calculate the flux in the core and the ratio error at rated condition of the current transformer. Assume iron loss in the core to be 1.5 watts. Neglect leakage flux and magnetizing current.
11. Draw a neat sketch of an induction cup relay and explain the operating principle.

OR

12. Explain the different types of amplitude comparators.
13. Explain the operating principle of impedance relays and the characteristic on the R-X diagram.

OR

14. Explain current setting and time setting of protective relay.
15. Describe with a neat sketch, the percentage differential protection of generator.

OR

16. Explain the protection against magnetizing inrush current of transformer.
17. Explain the operating techniques employed for wire pilot protection.

OR

18. Draw the functional diagram of numerical relays and explain the architecture.
19. Explain the principle of operation of reclosing relays.

OR

20. Explain SCADA based protection systems.