

Code No: 156CM

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JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year II Semester Examinations, August - 2022

POWER SYSTEM PROTECTION
(Electrical and Electronics Engineering)

Time: 3 Hours

Max.Marks:75

Answer any five questions
All questions carry equal marks

- 1.a) What are the different types of faults, causes of faults and their effects in a power system?
b) How would you explain primary and back up protection and also explain various methods of back-up protection? [8+7]
- 2.a) How would you explain the essential qualities of protective relaying?
b) How would you describe the microprocessor based over current relay and also write advantages of microprocessor based protective relay? [7+8]
- 3.a) IDMT relays are widely used for over current protection? Justify the statement with valid reasons.
b) Distinguish between an earth fault relay and an over current relay. Discuss various methods to energies an earth fault relay. [7+8]
- 4.a) How would you discuss the effect of power surges on the performance of different types of distance relays?
b) What are blinders? In what circumstances are they used in conjunction with a MHO relay? [7+8]
- 5.a) Explain the term 'pilot' with reference to power line protection. What are the different types of pilots which are presently employed? Discuss their fields of application.
b) What is carrier aided distance protection? What are its different types? [8+7]
- 6.a) An 11 KV, 100 MVA alternator is grounded through a resistance of 5Ω . The CTs have a ratio 1000/5. The relay is set to operate when there is an out of balance current of 1 A. What percentage of the generator winding will be protected by the percentage differential scheme of protection?
b) What type of protective schemes is employed for the protection of a large power transformer against short circuits? With neat sketch, discuss its working principle. [7+8]
- 7.a) Illustrate how an amplitude comparator can be converted to a phase comparator and vice versa.
b) Describe the realization of a directional over current relay using a microprocessor. [7+8]
- 8.a) Illustrate the working principle of HRC fuse with a neat sketch.
b) With a neat diagram, discuss the constructional and principle operation of SF₆ circuit breaker. What are its relative merits and demerits? [7+8]

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