

R18

Code No: 156CM

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year II Semester Examinations, August/September - 2021

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 advantages of static relays over electromagnetic relays?
b) The current rating of an overcurrent relay is 5A. The relay has a plug settings of 150% and the time setting (TMS) of 0.4. The CT ratio is 400/5. Determine the operating time of the relay for a fault current of 6000A. At TMS=1, operating time at various PSM are given in the below table. [7+8]

PSM	2	4	5	8	10	20
Operating time in seconds	10	5	4	3	2.8	2.4

- 2.a) Explain the concept of primary and back up protection.
b) List and explain the essential qualities of a protective relay. [7+8]
3. With a neat circuit diagram, explain directional earth fault relay. [15]
4. Explain the working principle, torque equation and operating characteristics of impedance relay. [15]
5. Explain about percentage differential protection of transformers. [15]
6. Explain the negative sequence protection of an alternator against unbalanced loads. [15]
7. Explain the working of static directional relay with a neat circuit diagram. [15]
- 8.a) With neat sketches, explain the recovery rate theory of arc interruption in a circuit breaker.
b) Explain the phenomenon of current chopping in a circuit breaker. [8+7]