Roll No.:.....

National Institute of Technology, Delhi

Name of the Examination: B. Tech.

Branch : Electrical & Electronics Engg. Semester : 6th

Title of the Course : Switch Gear and Protection Course Code : EEL 352

Time: 2 Hours Maximum Marks: 25

Note : 1. Answer all the questions.

2. Each question carries 5 marks.

4. Do not write anything on the question paper except Roll number

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1. Explain the construction and working of Impedance and Reactance relays. What are the disadvantages of each relay?

2. Explain solid, resistance and Peterson coil grounding schemes.

3. In 220kV system, reactance and capacitance up to location of CB is 8Ω and $0.025\mu F$. A resistance of 600Ω is connected across the contacts of CB. Determine (i) natural frequency of oscillations, (ii) damped frequency of oscillations, (iii) critical value of resistance, and (iv) value of resistance for which damped frequency of oscillation is one fourth of natural frequency of oscillations.

4. Explain the construction and working of SF6 CB. What are the advantages, disadvantages and applications of SF6 CB?

5. A 20 MVA transformer which is used to operate at 30% overload feeds a 11 KV bus bar through a circuit breaker. The transformer circuit breaker is equipped with a 1000/5 current transformer and the feeder circuit breaker with 400/5 current transformer and both the current transformers feed IDMTL relays having the following characteristics.

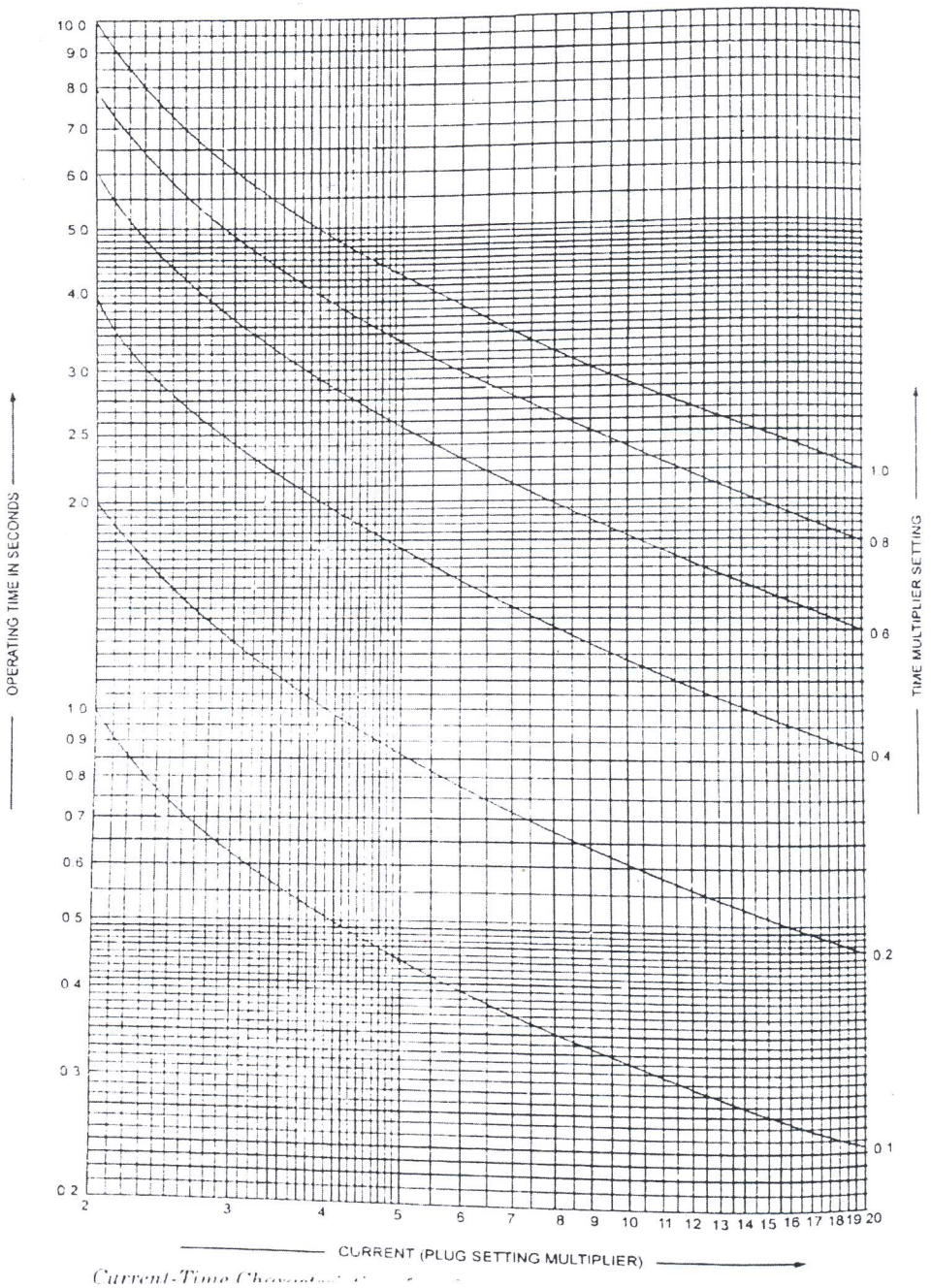
PSM	2	3	5	10	15	20
Time (seconds)	10	6	4.1	3	2.5	2.2

P.T.O

The relay on the feeder circuit breaker has 125% plug setting and 0.3 time multiplier setting. If a fault current of 5000 A flows from the transformer to the feeder, determine

(i) Operating time of feeder relay.

(ii) suggest suitable plug setting and time multiplier setting of the transformer relay to ensure adequate discrimination of 0.5 sec between the transformer relay and feeder relay.



Current-Time Characteristics