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Name of Examination : **Summer 2021** - (Preview)

Course Code & Course Name : **EE353U - Switchgear And Protection**

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Maximum Marks : **60**

Duration : **3 Hrs**

[Edit](#) [Print](#) [View Answer Key](#) [Close](#) **Answer Key Submission Type:** Marking scheme with model answers and solutions of numerical

Instructions:

1. All questions are compulsory.
2. Illustrate your answer with suitable figures/sketches wherever necessary.
3. Assume suitable additional data; if required.
4. Use of logarithmic table, drawing instruments and non programmable calculators is allowed.
5. Figures to the right indicate full marks.

1) Solve all sub-questions.

- a) Derive the expression for rate of rise of Re-striking voltage. [06]
- b) What is current chopping? Also explain how the effect of current chopping can be minimized. [06]

2) Solve all sub-questions.

- a) Describe the construction, principle and application of air break circuit breaker. [06]
- b) Discuss the principle of puffer type SF₆ circuit breaker with the help of sketches. [06]

3) Solve any two sub-questions.

- a) Discuss the following methods of earth fault protection: [06]
 - i) Core balance CT
 - ii) Relay connected in neutral to ground circuit
 - iii) Frame leakage protection.
- b) Describe directional over current protection with neat circuit diagram. [06]
- c) Explain the construction & operation of H.R.C. fuse in detail with advantages & Disadvantages. [06]

4) Solve any two sub-questions.

- a) List out the types of distance relay for transmission system and explain any one in detail. [06]
- b) Write short notes on [06]
 - i) Three step distance- time characteristics.
 - ii) Connections of distance relays for phase fault.
- c) In a system of 132 kV, the circuit phase to ground capacitance is 0.01 μF, the series inductance is 6 H. Calculate the voltage appearing across the pole of a C.B. if a magnetizing current of 10 amp. is interrupted (instantaneous). Calculate the value of resistance to be used across contact space to eliminate the re-striking voltage transient. [06]

5) Solve any two sub-questions.

- a) Discuss the problems arising in differential protection applied to transformer. [06]
- b) State the various protective installations for intercepting lightning surges. [06]
- c) What are the types of system grounding? Explain basic principle of each type. [06]

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