Code No: R203202D **R20** SET -1

III B. Tech II Semester Supplementary Examinations, December -2023
SWITCHGEAR AND PROTECTION
(Electrical and Electronics Engineering)

Time: 3 hours Max. Marks: 70

Answer any **FIVE** Questions **ONE** Question from **Each unit**
All Questions Carry Equal Marks
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UNIT-I

1. a) What is Switch gear? Explain various switch gear components. [7M]
   b) Explain about Axial blast Circuit breaker. [7M]

(OR)

2. a) Explain the reason for initiation of electric arc during contact separation. [7M]
   b) The following data refers to a 3 phase, 50 Hz generator. EMF between the lines 7.5 kV, reactance of generator and connected systems 4 Ohm, distributed capacitance to neutral 0.01microfarad, calculate the frequency of restricking voltage transient. [7M]

UNIT-II

3. a) Describe the construction and principle of operation of non directional induction type over current relay. [7M]
   b) What is universal torque equation? Using this equation derive the characteristics of (i) impedance relay (ii) reactance relay (iii) mho relay. [7M]

(OR)

4. a) Explain the requirement of primary and back up protection in any equipment. [7M]
   b) Discuss with necessary circuit diagram, the principle of operation of an induction disc relay. What are the advantages of induction cup relays over induction disc relays? [7M]

UNIT-III

5. a) What are the common transformer faults in a transformer? Explain them. [7M]
   b) Discuss Earth fault protection for transformers? [7M]

(OR)

6. Explain with a neat diagram, the application of the Mertz -price circulating current system to the protection of alternators .What precautions must be taken in installing this system? [14M]

UNIT-IV

7. a) Explain the non- directional time graded, current protection of feeders. [7M]
   b) Explain the directional time and current protection of feeders. [7M]

(OR)

8. Discuss in detail about the protection of generator using differential and biased differential protection scheme. [14M]

UNIT-V

9. a) What are the causes of over voltage on a power system? [7M]
   b) Why is it necessary to protect the lines and other equipment of the power system against over voltages? [7M]

(OR)

10. Write short notes on the following. i) klydonograph and magnetic link ii) Rod gap iii) Arcing horns iv) Basic impulse insulation level. [14M]