Code No: **R1641024**   **R16**   Set No. 1

IV B.Tech I Semester Advanced Supplementary Examinations, May - 2022
SWITCHGEAR AND PROTECTION
(Electrical and Electronics Engineering)

Time: 3 hours   Max. Marks: 70

Question paper consists of Part-A and Part-B
Answer ALL sub questions from Part-A
Answer any FOUR questions from Part-B
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PART–A *(14 Marks)*

1. a) Explain the effect of power factor on recovery voltage [2]
    b) Explain the basic need of a protective relays [2]
    c) List the various faults/abnormal operations that occur in the stator winding of [3]
       the Alternators
    d) Explain the main purpose of busbar protection [2]
    e) Explain the significance of phase comparator in static relays [2]
    f) Discuss the relative merits and demerits of Valve arresters and rod gaps [3]

PART–B *(4x14 = 56 Marks)*

2. a) Derive the expression for the Restriking voltage [7]
    b) Distinguish in detail between Air – blast circuit breakers and oil circuit breakers [7]

3. a) Explain the following classification of relays [7]
       i) Depending up on the construction and principle of operation
       ii) Depending upon application
       iii) Depending upon time of operation.
    b) Explain the operating characteristic of mho type distance relay. [7]

4. a) Explain the operation of circulating current protection scheme for earth fault [7]
       protection of alternator with a neat diagram
    b) Explain with a neat diagram about the Differential protection applied to [7]
       transformers.

5. a) Explain in detail about the Time graded protection for Radial feeder [7]
    b) Explain the operation of a Translay protection to a three-phase feeder with a [7]
       neat diagram

6. a) Distinguish between Static relays and Electromagnetic relays in detail [7]
    b) Explain the operation of Static differential relay with a neat block diagram [7]

7. a) Explain the following: [10]
       i) Dry flashover voltage ii) Wet flash over voltage iii) Impulse flash over
       voltage iv) Impulse spark over volt- time characteristic v) Basic Impulse
       insulation
    b) A 132 KV, three phase, 50 cycles, overhead line, 60 Km long has a capacitance [4]
       to earth for each line of 0.0250 µF per Km. Determine the inductance and KVA
       rating of the arc suppression coil suitable for this system.

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