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

IV B.Tech I Semester Supplementary Examinations, February- 2020

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) What is circuit breaker? [2]
   b) What is a protective relay? [2]
   c) List out the various types of faults that can occur on an alternator. [3]
   d) Define 3 zone protection. [3]
   e) Write a short note on level detector. [2]
   f) Write a short note on horn gap lightening arrestor. [2]

PART–B *(4x14 = 56 Marks)*

2. a) Discuss the recovery rate theory and energy balance theory of arc interruption. [7]
   b) For a 132kV system the reactance and capacitance up to the location of the circuit breaker is 4 ohms and .014μf respectively calculate
   a) Frequency of transient oscillations.
   b) Maximum value of restriking voltage across the contacts of circuit breaker. [7]

3. a) What are the various over current protection schemes? Discuss their merits and demerits [7]
   b) What are the characteristics of offset MHO relay? Discuss how such characteristics are realized. [7]

4. a) What types of protective schemes are employed for the protection of an alternator against overheating of stator and rotor? Discuss them briefly. [7]
   b) What types of protective schemes is employed for the protection of transformer against short circuits. [7]

5. a) Explain the scheme of protection for a parallel feeder when fed from one end. [7]
   b) Explain the scheme of protection of bus bar by using Differential protection. [7]

6. a) Draw and explain the characteristics of static impedance and static mho relays. [6]
   b) What is static relay? Explain the comparison between electromagnetic relays and static relays. [8]

7. a) What are the causes of over voltages arising on a power system? Why is it necessary to protect the lines and other equipment of the power system against over voltages? [7]
   b) What are the various methods of neutral grounding? Explain each of them in brief? [7]

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