

CBCS SCHEME

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15EE72

Seventh Semester B.E. Degree Examination, July/August 2021 Power System Protection

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions.

- 1 a. With a neat diagram, explain the Zones of protection in a typical Power System. (05 Marks)
b. List and explain any six essential qualities of Protective relay. (06 Marks)
c. State the advantages and disadvantages of Static relay over Electromagnetic relay. (05 Marks)
- 2 a. Explain the time – current characteristics of Protective relay. (06 Marks)
b. Explain the concept of Primary and Backup Protection. (05 Marks)
c. Draw the schematic diagram of Numerical relay and explain the functions of various components. (05 Marks)
- 3 a. With a neat sketch, explain the construction and working principle of Directional or Reverse Power Relay. (08 Marks)
b. What is mho relay? Explain the Operating principle, Torque equation and Operating characteristics of mho relay. (08 Marks)
- 4 a. With a neat sketch, explain the Directional Earth Fault Relay. (08 Marks)
b. Explain the effect of arc resistance on the Performance of Distance Relay in detail. (08 Marks)
- 5 a. With a neat sketch, explain the working of differential protection of 3 phase circuits and balance (opposed) voltage differential protection. (08 Marks)
b. Briefly explain the Carrier current protection, in the transmission line. (08 Marks)
- 6 a. Discuss the Merz – Price protection of alternator Alternator Stator windings (for both Y and Δ connected alternators). (08 Marks)
b. With a neat sketch, explain the construction and working of Buchholz Relay. (08 Marks)
- 7 a. Briefly explain with a neat sketch of Recovery Rate Theory and Energy Balance Theory of Arc interruption in a circuit breaker. (06 Marks)
b. With a neat sketch and waveform explain the :
i) Interruption of capacitive current ii) Current Chopping Phenomenon. (10 Marks)
- 8 a. With a neat sketch, explain the working of Axial Blast Circuit Breaker. (05 Marks)
b. State the advantages and disadvantages of SF₆ Circuit Breaker. (06 Marks)
c. Explain briefly Synthetic testing of Circuit Breaker. (05 Marks)
- 9 a. Explain the construction and working of HRC fuse. (06 Marks)
b. What are the causes of over voltages in a Power System? (05 Marks)
c. Write short notes on Insulation Co-ordination. (05 Marks)
- 10 a. With a neat diagram, explain the working of :
i) Rod gap arrestor ii) Expulsion type arrestor. (08 Marks)
b. Briefly explain various components of Gas Insulated Substation and discuss the merits and demerits of Gas Insulated Substation (GIS). (08 Marks)

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Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.