

# CBCS SCHEME



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18EE72

Seventh Semester B.E. Degree Examination, July/August 2022

## Power System Protection

Time: 3 hrs.

Max. Marks: 100

*Note: Answer any FIVE full questions, choosing ONE full question from each module.*

### Module-1

- 1 a. With a neat diagram, explain zones of protection in a power system. (10 Marks)
- b. List the merits and demerits of static relays. (04 Marks)
- c. Explain various methods of back-up protection. (06 Marks)

OR

- 2 a. Draw the schematic diagram of numerical relay and briefly explain the functions of its various components. (10 Marks)
- b. How protective relays are classified list them? (05 Marks)
- c. Briefly explain the essential qualities of a protective relays. (05 Marks)

### Module-2

- 3 a. With a neat sketch, explain the construction and working principle of a reverse power (or) directional relay. (10 Marks)
- b. Explain with a neat sketch the basic operation of a impedance relay. Also obtain its torque equation. (10 Marks)

OR

- 4 a. With a neat diagram, explain the protection scheme for Ring mains. (10 Marks)
- b. With a neat sketch, explain the principle operation of 'Mho' relay. (10 Marks)

### Module-3

- 5 a. Define the term 'Pilot' with reference to power line protection. List the different types of wire pilot protection schemes and explain any one of the scheme. (10 Marks)
- b. With the help of a neat sketch, explain the working of a "Buchholz relay" used for the protection of transformer. (10 Marks)

OR

- 6 a. With a neat sketch, explain the working of percentage (or) Biased differential relay. (10 Marks)
- b. A generator is protected with restricted Earth fault protection. The ratings are 11kV, 5000kVA. The percentage of winding protected against phase to ground fault is 80%. The relay setting is such that it trips for 25% out of balance. Calculate the resistance to be added in neutral to ground connection. (10 Marks)

### Module-4

- 7 a. With a neat sketch and wave form explain how interruption of capacitive current takes place in A.C circuit breaker. (10 Marks)
- b. With a neat sketch, explain the construction and working of non-puffer type SF<sub>6</sub> circuit breaker. (10 Marks)

OR

- 8 a. With the help of schematic diagram, explain the working of short circuit test plant. (10 Marks)
- b. With a neat sketch, explain the construction and working of Air break circuit breaker. (10 Marks)

**Module-5**

- 9 a. With the help of neat circuit diagram, explain the construction and working of HRC fuse. What are its advantages and disadvantages? (10 Marks)
- b. With a neat sketch, explain the construction and working of 'Klydonograph'. (05 Marks)
- c. What are the advantages and disadvantages of Gas Insulated Substation (GIS)? (05 Marks)

OR

- 10 a. What are the various components of a GIS? Briefly describe their functions. (10 Marks)
- b. Define the following:
- i) Fuse
  - ii) Fusing factor
  - iii) Rated current
  - iv) Fuse element (or) fuse wire
  - v) Minimum fusing current. (10 Marks)

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