CBCS SCHEME

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17EE72

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. List and explain the essential qualities of a protective relay (any four). **(08 Marks)**
b. Explain various methods of back-up protection. **(06 Marks)**
c. List the merits and demerits of static relays. **(06 Marks)**

OR

2 a. How protective relays are classified? List them. **(06 Marks)**
b. Draw the schematic diagram of a numerical relay and explain the functions of various components. **(08 Marks)**
c. With a neat diagram, explain zones of protection in a power system. **(06 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. With a neat sketch, explain the operation of an impedance relay. Also obtain the torque equation for the same. **(10 Marks)**

OR

4 a. With a neat circuit diagram, explain Directional Earth Fault Relay. **(10 Marks)**
b. With a neat schematic diagram, explain the construction and working of Mho Relay. **(10 Marks)**

Module-3

5 a. Explain the term 'pilot' with reference to power line protection. With neat schematic diagram, explain circulating current principle. **(10 Marks)**
b. Describe the balanced (opposed) voltage differential protection scheme. **(10 Marks)**

OR

6 a. What is Generator Protection? Explain the different types of protection provided for generator. **(10 Marks)**
b. With a neat diagram, explain the working of Buchholz relay. **(10 Marks)**

Module-4

7 a. 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 a Air-break Circuit Breaker. **(10 Marks)**

OR

8 a. A 50 Hz generator has an e.m.f. to neutral 7.5 KV (rms). The reactance of generator and the connected system is 4Ω and distributed capacitance to neutral is 0.01 μF with resistance negligible. Find:
(i) Maximum voltage across the circuit breaker contents
(ii) Frequency of oscillations
(iii) Maximum time to reach maximum voltage
(iv) Average RRRV **(10 Marks)**

b. With the help of schematic diagram, explain the working of short circuit test plant. **(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 neat sketch, explain the construction and working of Klydonograph. **(05 Marks)**

c. What are the causes of over voltages in a power system? **(05 Marks)**

OR

10 a. What are the various components of GIS? Briefly describe their functions. **(10 Marks)**

b. With neat diagram, explain the working of expulsion type lightning arrestor. **(05 Marks)**

c. What is insulation coordination? Explain the volt time curve. **(05 Marks)**

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