CBCS SCHEME

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15EE72

Seventh Semester B.E. Degree Examination, Dec.2023/Jan.2024
Power System Protection

Time: 3 hrs. Max. Marks: 80

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

Module-1

1 a. With a neat diagram, explain different zones of protection. **(04 Marks)**

b. Explain in detail what is primary and backup protection. **(06 Marks)**

c. Explain different performance parameters of protective relays. **(06 Marks)**

OR

2 a. With neat block diagram explain the working principle of Induction disc and Induction cap type relays. **(06 Marks)**

b. With neat block diagram, explain the operation of numerical relay. **(05 Marks)**

c. List the comparison between electromechanical relays and numerical relays along with their features. **(05 Marks)**

Module-2

3 a. With a neat sketch, explain Directional over current relay. **(08 Marks)**

b. Explain with a neat sketch, the basic operation of a impedance relay. **(08 Marks)**

OR

4 a. With a neat circuit diagram, explain Directional Earth Fault Relay. **(08 Marks)**

b. With a neat schematic diagram, explain the Construction , Working and Reactance Relay. **(08 Marks)**

Module-3

5 a. What are the important operating principles which are used in wire 'Pilot' schemes? With schematic diagram, explain circulating current principle. **(06 Marks)**

b. Explain the working principle of 'Buchholz' relay used for the protection of transformer. **(05 Marks)**

c. With schematic diagram, explain Balanced (opposed) Voltage differential protection. **(05 Marks)**

OR

6 a. With neat sketch, explain frame leakage protection scheme. **(04 Marks)**

b. With schematic diagram, explain protection of stator against over heating in an alternator. **(06 Marks)**

c. What is simple differential protection scheme? Explain its behavior during normal condition. **(06 Marks)**

Module-4

7 a. With the help of schematic diagram, explain fault clearing time of a circuit breaker. **(05 Marks)**

b. Explain different arc interruption method used in circuit breakers. **(06 Marks)**

c. With neat diagram, explain the working of Air break circuit breaker. **(05 Marks)**

OR

8 a. Explain the principle of current chopping in the circuit breaker. **(05 Marks)**
b. Explain in detail classification of circuit breakers. **(06 Marks)**
c. Write a note on HVDC circuit breakers. **(05 Marks)**

Module-5

9 a. With the help of neat circuit diagram, explain the construction and working of HRC fuse. **(06 Marks)**
b. What are the causes of Over voltages in a power system? **(06 Marks)**
c. Discuss the advantages and disadvantages of Gas Insulated Substations (GIS) as compared to Conventional Air Insulation Substations (AIS). **(04 Marks)**

OR

10 a. Define the following :
i) Fusing factor ii) Fuse iii) Fusing current. **(06 Marks)**
b. With a neat sketch, explain the working of Klydonograph. **(05 Marks)**
c. What are the various components of a GIS? Briefly describe their functions. **(05 Marks)**

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