

22524

12425

03 Hours / 70 Marks

Seat No.

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- Instructions* – (1) All Questions are *Compulsory*.
(2) Answer each next main Question on a new page.
(3) Illustrate your answers with neat sketches wherever necessary.
(4) Figures to the right indicate full marks.
(5) Assume suitable data, if necessary.
(6) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. **Attempt any FIVE of the following:** **10**
- a) State necessity of Protective system.
 - b) Draw neat circuit diagram of
 - i) Busbar reactor
 - ii) Feeder reactor
 - c) Define the following terms related to circuit breaker.
 - i) Breaking Capacity
 - ii) Making Capacity
 - d) Define:
 - i) Protective relay
 - ii) Relay time
 - e) State any two merits of bychholz relay.
 - f) Define “Single Phasing” in an induction motor.
 - g) State any four abnormalities in induction motor.

P.T.O.

2. Attempt any THREE of the following: 12

- a) Explain with neat diagram current limiting reactor.
- b) Define the following terms
 - i) Arc Voltage
 - ii) Recovery Voltage
 - iii) Restriking Voltage
 - iv) RRRV
- c) With the help of block diagram explain working of static relay.
- d) A 3 phase transformer of 220V/11KV line volt is connected in star/delta. The protective transformer on 220V side have current ratio of 400/5. What should be the CT ratio on 11KV side.

3. Attempt any THREE of the following: 12

- a) For 22KV, 3 phase 6MVA alternators having reactance of 20% each operate in parallel and supply power to 25 MVA 3 phase transformer of ratio 22KV/132KV. The transformer percentage reactance is 2.5%. Calculate the fault KVA on HV side of transformer.
- b) Compare fuse with circuit breaker on the following points
 - i) Operation
 - ii) Breaking Capacity
 - iii) Operating Time
 - iv) Applications
- c) With neat diagram explain working of microprocessor based over current relay.
- d) Explain with neat diagram Restricted Earth fault protection of Alternator.

- 4. Attempt any THREE of the following:** **12**
- a) Explain working of HRC fuse with neat construction diagram.
 - b) Describe the operation of Current differential relay with neat diagram.
 - c) Explain working of buchholz relay with neat diagram.
 - d) Draw a neat sketch of single phasing preventer.
 - e) Explain differential protection of busbar with neat diagram.
- 5. Attempt any TWO of the following:** **12**
- a) With a neat labelled diagram explain working of SF₆ circuit breaker.
 - b) Explain fundamental quality requirement of protective relay. (any six)
 - c) A 3 phase transformer of 420/1200 line volt is connected in star/delta. The protective transformer on 420V side have a current ratio of 600/S. What should be the CT ratio on 1200 volt side?
- 6. Attempt any TWO of the following:** **12**
- a) Explain construction and operation of Vacuum circuit breaker with neat diagram.
 - b) Explain construction and operation of Induction type directional power relay.
 - c) Explain time graded over current protection of transmission line.
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