

22524

22223

3 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) Use of Non-programmable Electronic Pocket Calculator is permissible.
 - (7) 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 any two functions of protective system.
 - b) List any four applications of HRC fuse.
 - c) State function of RCBO and MPCB
 - d) State the need of directional relay.
 - e) List any four protection schemes used for alternator.
 - f) Draw time - current characteristic of IDMT relay.
 - g) List any four faults related to busbar.

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- 2. Attempt any THREE of the following:** **12**
- a) State importance of feeder reactor. Write any two disadvantages of it.
 - b) Define : - arc voltage, restriking voltage, recovery voltage and RRRV.
 - c) A 3 ϕ 66 kV/33 kV star / delta transformer is protected by Merz - Price protection scheme. CT's on LV side have a ratio of 600/5. Find CT ratio on HV side.
 - d) Explain short circuit protection of 3 ϕ IM.
- 3. Attempt any THREE of the following:** **12**
- a) List different types of faults occurred on a power system. Draw necessary sketches (any four)
 - b) Explain working of vertical break isolator with neat sketch.
 - c) Define - Relay time, reset current, pick-up current, current setting.
 - d) Draw neat sketch of Buchholz relay. State any four points related to its construction.
 - e) With neat sketch explain pilot wire protection scheme for transmission line.
- 4. Attempt any THREE of the following:** **12**
- a) Explain with neat sketch working principle of distance relay.
 - b) Explain reverse power protection of 3 ϕ alternator.
 - c) With neat sketch explain working of restricted earth fault protection scheme of transformer.
 - d) List any four major faults related to 3 ϕ IM. Draw sketch of single phasing preventer.
 - e) Explain with neat sketch differential protection scheme of bus bar.

- 5. Attempt any TWO of the following: 12**
- a) Compare ACB and MCB on any six points.
 - b) Draw a block diagram of microprocessor based over current protection. State function of each block.
 - c) List any three difficulties experienced in differential protection of alternator. State the remedies to overcome each.
- 6. Attempt any TWO of the following: 12**
- a) Related to vacuum circuit breaker -
 - i) Draw neat sketch
 - ii) Write any four important points related to its construction.
 - iii) Give any two advantages and two disadvantages.
 - b) Describe any six fundamental quality requirements of protective relaying.
 - c) A plant consists of two 10 MVA generators of reactance 18% each and two 5 MVA generators of 12% each. All are connected to bus bar to supply a load through three step up transformers of 8 MVA each having reactance of 8%. Determine fault MVA on HV side of transformer.
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