

22524

11920

3 Hours / 70 Marks

Seat No.

--	--	--	--	--	--	--	--

- Instructions* –
- (1) All Questions are *Compulsory*.
 - (2) Illustrate your answers with neat sketches wherever necessary.
 - (3) Figures to the right indicate full marks.
 - (4) Assume suitable data, if necessary.
 - (5) Use of Non-programmable Electronic Pocket Calculator is permissible.
 - (6) Preferably, write the answers in sequential order.

Marks

- 1. Attempt any FIVE of the following:** **10**
- a) Draw neat circuit diagram of
 - (i) Feeder reactor and
 - (ii) Generator reactor
 - b) State four functions of protective system.
 - c) Define the term “Insulation co-ordination”.
 - d) Draw a typical time-current characteristic for IDMT relay.
 - e) List two limitations of Differential-Protection scheme for transformer.
 - f) State two requirements of transmission line protection.
 - g) State four abnormalities that taking place in case of motors.

P.T.O.

- 2. Attempt any THREE of the following:** **12**
- a) Explain in brief four causes of faults in the power system.
 - b) Define the following terms related to circuit breaker
 - (i) Breaking Capacity
 - (ii) Making Capacity
 - (iii) Short time rating and
 - (iv) Normal current rating
 - c) Define the following terms with respect to protective relays
 - (i) Relay time
 - (ii) Reset current
 - (iii) Plug setting multiplier and
 - (iv) Time setting multiplier.
 - d) A three phase, 66/11KV, star-delta connected transformer is protected by Merz-Price system. The CT's on LV side have a ratio of 400/5. Find the ratio of CT's on the HV side.
- 3. Attempt any THREE of the following:** **12**
- a) With neat diagram explain the operation of Horizontal break isolator.
 - b) Describe the working of HRC fuse with neat diagram.
 - c) With neat sketch explain the working of Thermal relay.
 - d) A star connected, 3-phase, 10MVA, 6.6KV alternator is protected by Merz-Price circulating current principle using 1000/5 ampers current transformers. The star point of the alternator is earthed through a resistance of 7.5Ω . If the minimum operating current for the relay is 0.5A, calculate the percentage of each phase of the stator winding which is unprotected against the earth faults, When the machine is operating at normal voltage.

- 4. Attempt any THREE of the following:** **12**
- a) “ELCB” is must for a residential installation”. Justify the statement.
 - b) Describe the operation of current differential relay with neat sketch.
 - c) Discuss in brief the principle of distance protection and state four advantages of distance protection scheme.
 - d) Explain differential protection scheme for busbars with neat sketch.
 - e) Explain with neat sketch, the Pilot wire protection scheme applied to transmission line.
- 5. Attempt any TWO of the following:** **12**
- a) Describe the construction and operation of Buchholz relay with neat labelled diagram.
 - b) Explain the working of single phasing preventer with neat diagram.
 - c) Two 11KV, 3-phase, 3000KVA generators having reactance of 15% operate in parallel. The generator supply power to a transmission line through a 6000KVA transformer of ratio 11/22KV and having leakage reactance of 5%. Calculate fault current and fault KVA on H.T. side of transformer.
- 6. Attempt any TWO of the following:** **12**
- a) Describe the construction of SF6 circuit breaker with neat diagram.
 - b) With the help of neat diagram, explain the operation of static relay.
 - c) Explain the “Differential Protection Scheme” used for alternators with neat labelled diagram.
-