

17508

11718

3 Hours / 100 Marks

Seat No.

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

- 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. a) **Attempt any THREE of the following:** **12**
 - (i) State the causes of faults in power system.
 - (ii) Define Plug setting multiplier and Time setting multiplier.
 - (iii) List out all the important faults which may occur in alternator.
 - (iv) State the abnormalities and faults in transformer protection.
- b) **Attempt any ONE of the following:** **6**
 - (i) Two three phase generators of ratings 1000 KVA and 1500 KVA, 3.3 KV having percentage reactance of 10 and 20 respectively with respect to their ratings, are connected to bus bars. A three phase short circuit occurs on the bus. Find the short circuit current.
 - (ii) Describe with neat sketch the principle of operation of vacuum circuit breaker.

P.T.O.

- 2. Attempt any FOUR of the following:** **16**
- a) Draw the symbols and state the function of
 - (i) Isolator
 - (ii) Circuit breaker
 - (iii) Earthing switch
 - (iv) Lightning arrester
 - b) Explain the construction and working of HRC fuse with diagram.
 - c) Draw the block diagram of microprocessor based over current relay.
 - d) Explain merz price protection of alternator.
 - e) Describe the behaviour of three-phase induction motor under single phasing.
 - f) Describe differential protection of bus bar with neat labelled diagram.
- 3. Attempt any FOUR of the following:** **16**
- a) Compare the fuse and MCCB on the basis of speed of operation, cost, construction and replacement strategy.
 - b) State the specifications of CT and PT as a protective transformer.
 - c) What is differential relay? Explain the working of current differential relay.
 - d) Explain with neat diagram the negative phase sequence current protection for an alternator.
 - e) Explain with neat sketch earth fault protection for star-delta transformer.
- 4. a) Attempt any THREE of the following:** **12**
- (i) Describe with neat sketch arc extinction of SF₆ circuit breaker.
 - (ii) Write any two advantages and disadvantages of static over current relay.
 - (iii) Explain reverse power protection of alternator.
 - (iv) Describe with circuit diagram of single phase preventer.

- b) **Attempt any ONE of the following:** **6**
- (i) Draw neat circuit diagram of induction type directional over current relay.
 - (ii) How impedance relay used for transmission line protection?
- 5. Attempt any FOUR of the following:** **16**
- a) Define the following terms: Rated normal current; short time rating; Rated breaking current; Rated symmetrical breaking current.
 - b) Explain with neat diagram solenoid type over current relay.
 - c) Give location of buchholz relay? State application of it for transformer protection.
 - d) Draw circuit diagram for biased differential protection used for transmission line protection.
 - e) State the functions of substation earthing system.
 - f) State different causes of over voltages in power system network.
- 6. Attempt any FOUR of the following:** **16**
- a) A-3-phase transformer of 220 V/11 kV line volts is connected in star/delta. The protective transformers on 220 V side have current ratio of 600/s. What should be the CT ratio on 11 kV side?
 - b) Describe with a neat diagram of differential protection provided for transformer.
 - c) State necessity of neutral earthing and list the different methods.
 - d) Explain the voltage surge? Draw a typical lightning voltage surge.
 - e) Explain insulation co-ordination? What is its necessity?
-