22524

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 <u>FIVE</u> of the following:**   **10**

a) Draw diagram of:

i)   Busbar reactor

ii)   Generator reactor

b) Give any two advantages of SF6 C.B.

c) Draw the symbol and state function of C.B.

d) Define Plug setting multiplier and Time setting multiplier.

e) Write any two different fault occurs in alternator.

f) What do you mean by incipient faults.

g) List any two faults occurs in 3ϕ I.m.

Marks

2. **Attempt any THREE of the following:** 12

   a) Write any eight causes of fault occurrence in the power system.

   b) Explain construction of H.R.C. Fuse.

   c) Draw neat circuit diagram of solenoid type relay.

   d) State the requirement of transmission line protection.

3. **Attempt any THREE of the following:** 12

   a) Write essential features of good protective system.

   b) Distinguish between C.B. and Isolator.

   c) Draw neat sketch of Buchholz relay.

   d) Draw neat sketch of single phase preventer for 3-ϕ Induction Motor.

4. **Attempt any THREE of the following:** 12

   a) What is reactor? Classify reactors on the basis of their location.

   b) State the specification of CT and PT as protective transformers.

   c) Draw neat sketch of percentage differential protection of a transformer.

   d) Explain the principle of time graded protection of feeders using IDMT over current relays.

   e) Explain with a neat sketch pilot wire protection scheme applied to transmission line.

5.   **Attempt any TWO of the following:**   **12**

a) Draw and explain a neat circuit diagram of vacuum circuit breaker. State any two advantages of it.

b) Determine the time of operation of a 1A, 3 seconds over current relay having plug setting of 125% and a time multiplier of 0.6. The supplying CT is rated 400: 1A and fault current is 400A. The relay characteristics is as given below.

PSM	1.3	2	4	8	10	20
Time of operation in seconds	30	10	5	3.3	3	2.2

c) A - 3 phase 33/6.6 KV, star - delta transformer is protected by merz price circulating current relay if the CTs on the low voltage side have a ratio of 300/5. Determine the ratio of CTs on the high voltage side. Draw a neat diagram and indicate the values at appropriate places.

6.   **Attempt any TWO of the following:**   **12**

a) For a 10 MVA, 132 KV / 6.6 KV power transformer with delta-star connections, obtain CT ratio for the differential protection scheme to circulate a current of 5A in the pilot wires. Draw schematic diagram for the given configuration.

b) Explain with a neat sketch the operation of attracted armature type relay. Also give its two merits and demerits.

c) Draw the construction diagram of ELCB and explain how ELCB gives protection against earth leakage fault.

————