BE/Insem/APR - 191
B.E. (Electrical)
SWITCHGEAR & PROTECTION
(2015 Pattern)

Time : 1 Hour]

[Max. Marks : 30

Instructions to the candidates :

1) *Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6.*
2) *Neat diagrams must be drawn wherever necessary.*
3) *Figure to right indicate full marks.*
4) *Use of Non-programmable Scientific Calculator is allowed.*
5) *Assume suitable data if necessary.*

Q1) a) Obtain the torque equation of Induction type Relay. **[4]**

b) What is 'Backup Protection'? Explain the various types of Back protections used worldwide. **[6]**

OR

Q2) a) Explain the terms PSM and TMS in case of Relays. **[4]**

b) Classify the various types of relays based construction, principal of operation and applications. **[6]**

Q3) a) Explain the concept of current chopping with neat waveform. **[4]**

b) Explain the theories related to Arc Extinction. **[6]**

OR

Q4) a) In a 132 kV system, phase to ground capacitance is 0.01 microfarad and series inductance is 6 H. Calculate the voltage across the breaker pole of Air blast CB, if magnetizing current of 10A is interrupted. Also calculate the resistance to be used to eliminate the restriking voltage transients.**[4]**

b) Derive the expression for restriking voltage and thereafter the value of $RRRV_{max}$. **[6]**

P.T.O.

Q5) a) Explain the significance of terms related to H.V. Circuit breaker **[4]**

   i) Rated frequency

   ii) Rated insulation level

   b) Draw the construction diagram and explain the working principle of Air circuit breaker. **[6]**

<div align="center">OR</div>

Q6) a) Explain the working of Auto reclosure as used for EHV lines in India. **[4]**

   b) Draw the neat sketch & explain the construction & working principle of SF6 circuit breaker. **[6]**

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