APR-17/BE/Insem - 36
B.E. (Electrical)
SWITCHGEAR & PROTECTION

Time :1 Hour]   *[Max. Marks : 30*

Instructions to the candidates:
  1) *Neat diagrams must be drawn wherever necessary.*
  2) *Figures to the right indicate full marks.*
  3) *Use of electronic pocket calculator is allowed.*
  4) *Assume suitable data, if necessary.*
  5) *Answer Q No.1 or 2, Q No.3 or 4, Q No.5 or 6.*

Q1) a) Explain the need of protective system. What are different causes of faults. Explain effects of faults. **[6]**

      b) With neat diagram explain the operating principle of distance relay. **[4]**

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

Q2) a) Explain following terms in case of Induction relay. **[6]**

           i) Current setting

           ii) Plug setting multiplier (PSM)

           iii) Time setting & TSM

      b) Write short note on 'Zones of Protection'. **[4]**

Q3) a) A three phase alternater has line voltage as 11 kv. It is connected to a CB. The inductive reactance upto CB is 5Ω/phase. The distributed capacitance upto CB between phase & hectral is 0.01 µF. Determine **[6]**

           i) Peak restriking voltage across the CB.

           ii) Frequency & restriking voltage transients

           iii) RRRV

      b) Explain low resistance Interruption principle in case of CB. **[4]**

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

<div align="right">*P.T.O.*</div>

Q4) a) Describe in detail the concept of Resistance switching associated with high voltage circuit breakers. **[6]**

b) In a system of 132 kv, the circuit phase to ground capacitance is 0.01 µf, the inductance is 6 H. Calculate the voltage appearing across the pole of a CB if a magnetizing current of 10 A is interrupted (instantaneous). Also calculate the value of resistance to be used across contact space to elliminate the restriking voltage. **[4]**

Q5) a) With neat diagram explain the construction and working of puffer type SF_6 CB. **[8]**

b) Explain making capacity of CB. **[2]**

OR

Q6) a) With neat diagram explain the construction and working of vacuum circuit breaker. **[8]**

b) Explain short time current rating of CB. **[2]**

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