BE/Insem/APR-45
B.E. (Electrical) (Semester - II)
SWITCHGEAR & PROTECTION
(2012 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) *Figures to the right indicate full marks.*
4) *Use of electronic pocket calculator is allowed.*
5) *Assume suitable data, if necessary.*

Q1) a) With neat diagram explain working of Watt-hour meter type induction disc over current relay. **[6]**

b) Classify relays on the basis of operating time. **[4]**

OR

Q2) a) An IDMT type over current relay is used to protect a feeder through 500/1 ACT. The relay has current setting of 125% & TSM = 0.35 Calculate the time of operation of relay if fault current of 10,000 A flows through the feeder. Make use of following characteristics **[6]**

PSM	2	3	5	8	10	16
Time for unity TSM 100% Current = 1A	10	6	4.5	3.2	3	2.5

b) Explain following qualities of protective relays **[4]**

i) Selectivity.

ii) Stability.

P.T.O.

Q3) a) With neat diagram explain different are interruption methods used in circuit breakers. **[8]**

b) Define restriking voltage in Circuit Breaker. **[2]**

OR

Q4) a) A 50 Hz 3 phase alternator with grounded neutral has an inductance of 1.6 mH per phase and is connected to busbars through a circuit breaker. The capacitance to earth of the circuit breaker between the alternator & the circuit breaker is 0.0032 µF per phase. Due to short circuit on the busbars the breaker opens when the rms value of the current is 8000 Amp. Determine **[8]**

    i) Frequency of oscillations.

    ii) Recovery voltage.

    iii) Restriking voltage.

    iv) Time to attain max. RRRV.

    v) Max. value of RRRV.

b) What do you mean by 'Current Chopping'? **[2]**

Q5) a) With neat diagram explain construction & working of Vacuum Circuit breaker. **[8]**

b) Define Making Current of CB. **[2]**

OR

Q6) a) Explain the properties of SF_6 gas. **[8]**

b) Define symmetrical breaking current of CB. **[2]**

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