Total No. of Questions : 10] **SEAT No. :**

P2298 **[Total No. of Pages : 3**

[5254]-632

B.E. (Electrical)

SWITCHGEAR & PROTECTION

(2012 Pattern) (Semester - II)

Time : 2½ Hours] ***[Max. Marks : 70***

Instructions to the candidates:

1) ***Answer Q. No.1 or 2, Q.No.3 or 4, Q. No.5 or 6, Q. No.7or 8, Q. No.9 or 10***
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) What are essential qualities of protective relaying. **[6]**

b) Write a short note on current chopping. **[4]**

OR

Q2) a) Explain the following terms w.r.t. circuit breaker. **[6]**

i) Restriking voltage.

ii) R.R.R.V.

iii) Recovery voltage

b) An instantaneous value of magnetizing current of 5.5 A in a 132 kV transmission line having line to ground capacitance of 0.015 μF and inductance of 5 H is required to be interrupted. Determine **[4]**

(i) the voltage across the contacts of circuit breaker at the time of current interruption.

(ii) the resistance to be inserted in the contacts in order to avoid restriking voltage.

P.T.O.

Q3) a) Explain construction and working of vacuum circuit breaker. **[6]**

b) Explain the term resistance switching. **[4]**

OR

Q4) a) Explain current graded overcurrent protection scheme. **[4]**

b) Explain puffer type SF6 circuit breaker. **[6]**

Q5) a) Compare static relays with electromechanical relays with respect to construction, working principle, advantages and limitations. **[8]**

b) Compare gap type and gapless type lightning arresters. **[8]**

OR

Q6) a) Write a short note on : **[8]**

i) Anti-Aliasing filter.

ii) Sampling theorem.

b) With suitable diagram explain construction and working of Rod-gap arrester. **[8]**

Q7) a) Explain the phenomenon of overfluxing in the transformer and protection used against it. **[9]**

b) A 3 phase 12 kV alternator winding is required to be protected against earth faults. The 80% of winding is protected against earth faults by a relay having pick up current of 1 Amp. The CT has a ratio of 1000/5. Calculate resistance to be connected between neutral and ground. If resistance of 10 ohms is connected between neutral to ground, how much percentage of winding is protected against earth fault. **[9]**

OR

Q8) a) Explain protection against single phasing in 3 phase induction motor. **[9]**

b) Explain the abnormal conditions like unbalance loading, overspeeding and loss of prime mover in case of alternator. **[9]**

Q9) a) Explain the step distance protection scheme for transmission line. Also draw the neat sketch for the same. **[8]**

b) Explain the need of high impedance relay for differential protection of busbar. **[8]**

OR

Q10)a) Write a short note on Wide Area Measurement System (WAM). **[8]**

b) Explain how reactance relay is used for distance protection. Derive its torque equation. Draw its characteristics on R-X diagram. **[8]**

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