PVP 14

Code: EE7T3

IV B.Tech - I Semester – Regular/Supplementary Examinations
March - 2021

SWITCHGEAR PROTECTION & CARRIER COMMUNICATION
(ELECTRICAL & ELECTRONICS ENGINEERING)

Duration: 3 hours Max. Marks: 70

PART – A

Answer ***all*** the questions. All questions carry equal marks

11 x 2 = 22 M

1.

a) Explain resistance switching.
b) What is meant by recovery voltage?
c) What are the fundamental requirements of a protective relay?
d) What is static relay? What are the advantages of static relays over electromagnetic relays?
e) Draw the R-X characteristics of MHO relay and explain it.
f) What are the draw backs of over current relay?
g) Briefly explain the function of Buchholz relay.
h) What is restricted earth fault protection?
i) What is the purpose of ground wire?
j) What is meant by insulation coordination?
k) List different methods of neutral grounding.

PART – B

Answer any ***THREE*** questions. All questions carry equal marks.

3 x 16 = 48 M

2. a) In a 132 kV system, the reactance per phase up to the location of the circuit breaker is 8 ohms and capacitance to earth is 0.05 μF. Calculate
(i) The maximum value of restriking voltage
(ii) The maximum value of RRRV and
(iii) The frequency of transient oscillation. 8 M

b) Explain the phenomena of current chopping in a circuit breaker. 8 M

3. a) Derive the equation for torque developed in an induction relay. 8 M

b) With neat diagrams explain how an amplitude comparator can be converted to a phase comparator and vice-versa. 8 M

4. a) Explain the principle of operation of IDMT relay. How the directional characteristics are introduced? 8 M

b) Compare the characteristics of impedance relay and reactance relay. Also give their applications. 8 M

5. a) Explain in detail about " protection of transformers using differential protection". 8 M

b) The neutral of a 3-phase, 20 MVA,11kV alternator is earthed through a resistance of 5 ohm. The relay is set to operate when there is an out of balance current of 1.5A. The CTs have a ratio of 1000/5. What % of the winding is protected against an earth fault? What should be the minimum value of the earthing resistance to protect 90% of the winding? 8 M

6. a) Explain Peterson coil (Arc suppression coil) grounding and derive the equation for " L." inductance of coil. 8 M

b) Explain clearly how the rating of lightning arrestor is selected, What is the best location of a lightning arrestor and why? 8 M