

1078
B.E. (Electrical and Electronics Engineering)
Fifth Semester
EE-501: Power Systems – II

Time allowed: 3 Hours

Max. Marks: 50

NOTE: Attempt five questions in all, including Question No. 1 which is compulsory and selecting two questions from each Part. Missing data (if any) can be appropriately assumed.

x-x-x

Q1. Explain briefly

- A) What is the use of symmetrical components in power systems? (2)
- B) Differentiate between the A stroke and B stroke. (2)
- C) List out all types of static relays. (2)
- D) Why current chopping is not common in oil circuit breakers? (2)
- E) Differentiate system earthing and equipment earthing. (2)

Part A

Q2. A) A single diagram of a power system network is as shown in fig. 1. Having system data as follows

Element	Positive sequence reactance	Negative sequence reactance	Zero sequence reactance
Generator	0.1	0.12	0.05
Motor 1	0.05	0.06	0.025
Motor 2	0.05	0.06	0.025
Transformer 1	0.07	0.07	0.07
Transformer 2	0.08	0.08	0.08
Line	0.10	0.10	0.10

Generator grounding reactance is 0.5 per unit. (i) draw sequence networks, (ii) find the fault currents for the line to line on phase b and c at point q. assume 1.0 pu pre fault voltage throughout. (05)

B) Find sequence impedance and draw the sequence diagram of a synchronous machine. (05)

Q3. A) What types of protective devices are used for the protection of the alternator against overheating of its (i) stator and (ii) rotor? Discuss in brief. (04)

B). A three phase, 200MVA, 11/0.4 KV transformer is connected as delta/ star. The protection transformer on the 0.4 KV side has turn ratio of 500/5. What will be CT ratio on the high voltage side? Also obtain the circulating current when the fault of 750A of the following types occur on the low voltage side. (i) Earth fault within the protection zone. (ii) earth fault outside the protection zone (iii) phase to phase fault within the protection zone. (iv) phase to phase fault outside the protection zone. (06)

Q4. A) Explain the zonal protection scheme for feeder. Describe the reactance relay characteristic for 3- zone protection. Also draw the contact circuit for the same. (05)

B) Explain with the help of neat circuit diagram of the differential protection scheme for star/ delta connected transformer. Describe with a sketch the operation of buchholz relay. (05)

Part B

Q5. A) Explain in detail the working of SF6 circuit breaker with the help of neat diagrams. (05)

B) Explain the concept of current chopping associated with the axial blast circuit breaker. How this dangerous phenomenon is rectified by resistance switching. (05)

Q6. A) Explain in detail the various causes of the dangerously high voltages on the transmission system and their elimination. (05)

B) Explain in detail the working of horn gap arrester. What is the purpose of inserting a resistance between the horn gap arrester and the line? (05)

Q7. A) A 132KV, three phase, 50Hz transmission line 192 KM long consists of three conductors of effective diameter of 20mm arranged in a vertical plane with 4 m spacing and regularly transposed. Find the inductance and KVA rating of the arrester suppressor coil. (05)

B) What are step and touch potentials? How can they be reduced to the safe values? Explain the function of harmonic suppressor. (05)

x-x-x