

B.E. Seventh Semester (Elect Engg (E & P), Ele and Electro, Ele & Power, Ele. Energy) (CGS)
10459 : Electrical Power - II : 7 EE 03 / 7 EP 03 / 7 EL 03

P. Pages : 2

Time : Three Hours



AU - 2905

Max. Marks : 80

- Notes :
1. Answer **Three** question from Section A and **Three** question from Section B.
 2. Due credit will be given to neatness and adequate dimensions.
 3. Assume suitable data wherever necessary.
 4. Illustrate your answer necessary with the help of neat sketches.
 5. Use of pen Black ink/refill only for writing the answer book.

SECTION - A

1. a) What is ' α ' operator? How will you represent the phase quantities in terms of symmetrical component. 8
b) Prove that the symmetrical component transformation in power invariant. 6

OR

2. a) A Delta connected balanced resistive load is connected across an unbalanced three phase supply with the current in line A ($I_a = 10 \angle 30^\circ$) & current in line B ($I_B = 15 \angle -60^\circ$). Find the symmetrical components of line currents. Also find the symmetrical components of delta currents. Do you notice any relationship between symmetrical components of line & delta current? Comment. 7
b) Draw and Explain sequence impedance of transmission line network. 7
3. a) A 15MVA, 6.6kV, 3 phase alternator connected through a 5 cycle oil circuit breaker had $x_d'' = 10\%$, $x_d' = 15\%$, $x_d = 80\%$ on no-load at rated voltage a 3 phase symmetrical short circuit occurs just beyond circuit breakers. Determine. 7
i) Steady state short circuit current.
ii) Maximum possible d.c. component of short circuit current &
iii) The interrupting capacity of the circuit breaker.
b) Explain briefly 'short circuit of unloaded synchronous machine. 6

OR

4. a) Explain briefly transient on a transmission line with suitable expression & wave form. 7
b) Explain the various type of current limiting reactors with their advantages & disadvantages. 6
5. a) What are the various unsymmetrical faults? Explain how symmetrical component method can be used for the analysis of unsymmetrical faults. 7
b) A three phase, 11kV, 10MVA alternator the sequence reactance of $x_0 = 0.05\text{pu}$, $x_1 = 0.15\text{pu}$ and $x_2 = 0.15\text{pu}$. If the generator is on no load. Find the ratio of fault current for LG fault to that when all the three phases, are dead short circuited. 6

OR

6. a) Develop an equivalent network showing the interconnection of sequence network to simulate a line to line fault. 7
- b) A 50 MVA, 11 kV, three phase synchronous generator was subjected to different type of fault. The fault current are as follows. 6
- LG fault = 4200A, L-L fault = 2600A
- LLI fault = 2000A. The generator neutral is solidly grounded find the per unit values of the three sequence reactance of the generator.

SECTION – B

7. a) What is lightening? Describe the mechanism of lightning discharge. 7
- b) Write a short notes on : 7
- i) Earthing screen.
- ii) Overhead ground wire.

OR

8. a) What are the BILs? Explain their significance in power system studies. 7
- b) Explain Expulsion Type of Lightning Arrester with neat sketch. 7
9. a) Discuss comparison of HVDC system with HVAC system. 7
- b) Explain the different types of HVDC links. 6

OR

10. a) Draw the general layout of HVDC transmission. Explain the function of each. 7
- b) Explain the concept of DC circuit interruption and hence the working of d.c. circuit breaker. 6
11. a) Describe the concept of FACTS. 6
- b) Explain the working of SVC in detail. 7

OR

12. a) Explain the working of TCSC with neat sketch. 6
- b) State the principle of STATCOM with necessary schematic. 7
