

#### Unit IV

No. of Printed Pages : 05

Roll No. ....

7. Three 6.6 kV, 3-phase 10 MVA alternators are connected to a grid. The positive sequence reactance of each alternator is 0.15 p.u. while the negative and zero sequence reactances are 75% and 30% of positive sequence reactance respectively. A single line to ground fault occurs on the grid bus. Determine the fault current, if :

- (a) All the alternator neutral points are solidly grounded.
- (b) One alternator neutral is solidly grounded and other two neutrals are isolated.
- (c) One alternator neutral is grounded through 0.3 ohm resistance and the other two neutrals are isolated.

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8. A 30 MVA, 3-phase 11 kV, 50 Hz alternator, having the neutral solidly grounded, is operating at no load. It has a reactance to positive sequence currents of 2.5 ohms. The

**AA-43**

**M.Tech. EXAMINATION, May 2018**

(First Semester)

(B. Scheme) (Re-appear Only)

EE(PS)

MPS505B

ADVANCED POWER SYSTEM  
ANALYSIS

*Time : 3 Hours]*

*[Maximum Marks : 75*

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Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

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**Note :** Attempt *Five* questions in all, selecting at least *one* question from each Unit. All questions carry equal marks.

## Unit I

1. Explain in detail the following :
  - (a) Growth of power systems. 7½
  - (b) Performance of transmission systems. 7½
2. Write short notes on the following :
  - (a) Ferranti Effect 7½
  - (b) State Estimation. 7½

4. Verify the following relations for the network shown in Fig. (1) :

(a)  $A_b K^t = U$  6

(b)  $B_l = A_l K^t$  3

(c)  $C_b = -B_l^t$

(d)  $\hat{C}\hat{B}^t = U$ .

## Unit II

3.

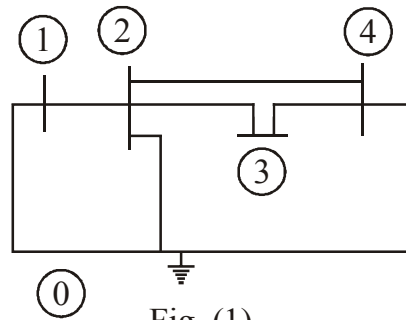


Fig. (1)

Form the network matrices  $Y_{Bus}$ ,  $Y_{BR}$  and  $Z_{Loop}$  by singular transformation for the network shown in Fig. (1) above. 15

## Unit III

5. Solve the following equations by the N-R method : 15

$$x_1^2 - 4x_2 - 4 = 0$$

$$2x_1 - x_2 - 2 = 0$$

6. (a) Explain the difference between G-S and N-R methods. 7½

- (b) Explain Fast Decoupled Load Flow. 7½

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- (a) The currents in the faulted phase.
- (b) The current through ground.
- (c) The voltage of healthy phase to neutral.

**15**

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