(b) Write in brief about the types of buses for load flow analysis. 3

(c) What is the significance of load flow analysis ? 3

5. (a) Discuss briefly about the significance of short circuit studies in power system. 3

(b) How is the three phase power system represented under steady state condition and for short circuit studies ? What are the different assumptions made ? 5

(c) For a three phase to ground fault at bus 'P' in a power system obtain the expression for :

(i) Faulted bus voltage

(ii) Fault voltage

(iii) Voltage at other buses. 12

6. (a) State the assumptions made for transient stability studies. 3

(b) Derive the swing equation of machine connected to an infinite bus through a transmission network. 5

(c) With the help of a flow chart, discuss the algorithm to be used for transient stability study of power system which employs modified Euler's method. 12

RVK/KW/13/3280/3614

Faculty of Engineering & Technology

Eighth Semester B.E. (Electrical)/Eighth Semester B.E.P.T. (Electrical) Examination

COMPUTER APPLICATIONS IN ELECTRICAL ENGINEERING

Sections—A & B

Time—Three Hours] [Maximum Marks—80

INSTRUCTIONS TO CANDIDATES

(1) All questions carry marks as indicated.

(2) Answer **TWO** questions from Section A and **TWO** questions from Section B.

(3) Assume suitable data wherever necessary.

(4) Illustrate your answers wherever necessary with the help of neat sketches.

(5) Use of non-programmable electronic calculator is permitted.

SECTION—A

1. (a) Derive an expression for branch admittance matrix using singular transformation. 8

(b) The positive sequence reactances for the network are shown in Fig. Q. 1(b). Designate the elements

A-B and D-F as links and node G as the reference bus. Form :

(i) Bus incidence matrix. 2

(ii) Branch path incidence matrix. 2

(iii) Basic cut set incidence matrix. 2

(iv) Basic loop incidence matrix. 2

(v) Bus admittance matrix Y_{BUS} using singular transformation. 4

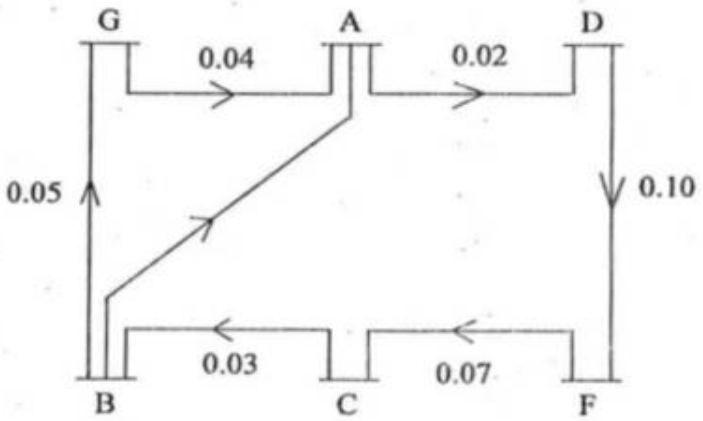

Fig. Q. 1(b)

2. For the system shown in Fig. Q. 2, form the bus impedance matrix using an algorithm. Self impedances of different elements are given in Fig. Q. 2 select bus 3 as reference bus and find how the Z_{BUS} so formed

can be modified if an element connected between bus 1-4 is removed from the system. 20

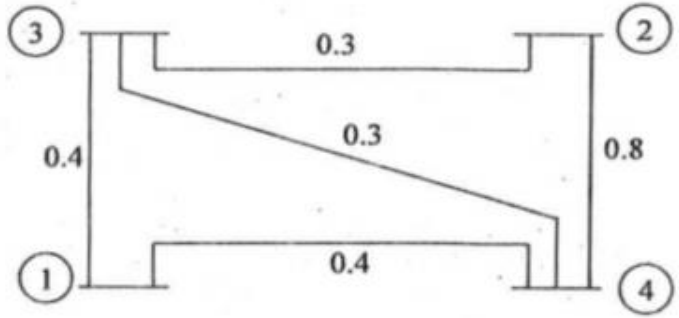

Fig. Q. 2

3. (a) How three phase network component is represented in impedance and admittance form ? Write down the performance equation of the three phase element in both these forms. 7

(b) Using suitable transformation matrix 'T', transform the three phase impedance matrix to its equivalent in 0, 1, 2 sequence quantities. Assume stationary and rotating elements. 10

(c) Show that the transformation matrix T_s is a unitary matrix. 3

SECTION—B

4. (a) Give and explain the flow chart for load flow solution in power system by Gauss-Seidal iterative method. Explain how the procedure is modified to take into account the existence of voltage controlled buses. 14