CBCS SCHEME

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15EE71

Seventh Semester B.E. Degree Examination, Dec.2019/Jan.2020
Power System Analysis – II

Time: 3 hrs. Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

1 a. Define the following with simple examples:
(i) Tree
(ii) Element bus incidence matrix **(04 Marks)**

b. Explain how buses are classified for load flow study. **(06 Marks)**

c. Obtain Y_{bus} by singular transformation method for the system having following data. Take bus 4 as ref bus

Element No.	1	2	3	4	5
Bus code (p-q)	1-2	2-3	3-4	1-4	2-4
Admittance (pu)	2	1.5	3	2.5	4

(06 Marks)

OR

2 a. What is primitive network? Obtain admittance form of primitive network. **(04 Marks)**

b. Explain the method of Y_{bus} by singular transformation. **(06 Marks)**

c. For the system shown in Fig.Q2(c) obtain solution of voltage and angles of bus 2 and 3 at the end of one iteration. Using Gauss-Seidel load flow method. Use flat start. Line data is in impedance form.

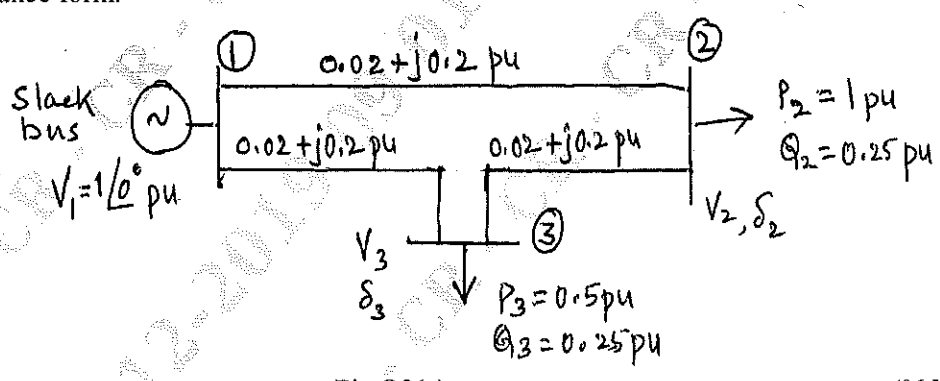

Fig.Q2(c) **(06 Marks)**

Module-2

3 a. What are Jacobian elements? Obtain Jacobian elements for basic equations for J_1 and J_3 only. **(04 Marks)**

b. Give the algorithm for Newton-Raphson (NRLF) load flow. **(06 Marks)**

c. Explain any two methods of control of voltage profile. **(06 Marks)**

OR

4 a. Explain the control of voltage by Tap changing transformer. **(04 Marks)**

b. Draw a flow chart for Fast Decoupled Load Flow (FDLF) method. **(06 Marks)**

c. Compare load flow methods with standard features. **(06 Marks)**

Module-3

5 a. Explain the followings:
(i) Input-output curve
(ii) Heat rate curve
related to thermal plants **(04 Marks)**

b. Define Unit Commitment. Explain Dynamic programming method of Unit Commitment solution. **(06 Marks)**

c. With the help of two state model of generator derive probability of availability and unavailability in terms of failure rate and repair rate. **(06 Marks)**

OR

6 a. The fuel input per hour of plant 1 and plant 2 are given by,
$F_1 = 0.2P_1^2 + 40P_1 + 120$ RS/Hr $F_2 = 0.25P_2^2 + 30P_2 + 150$ RS/Hr
Determine the economic scheduling neglecting the losses for a load of 180 MW. Also calculate cost of production of 180 MW for the obtained schedule. **(04 Marks)**

b. Obtain transmission line loss coefficients interms of plant generation capacities for two units delivering a load. **(06 Marks)**

c. Obtain economic scheduling for a system having transmission line losses and no limits on generators. **(06 Marks)**

Module-4

7 a. Explain the followings:
(i) Loss of Load Probability (LOLP)
(ii) Frequency and duration of state (FAD) **(04 Marks)**

b. Explain hydro-thermal scheduling in brief with the mathematical formula. **(06 Marks)**

c. With the help of Bath tub curve, explain different failures in a system and initiatives to reduce the failures. **(06 Marks)**

OR

8 a. List and explain advantages of maintenance scheduling. **(04 Marks)**

b. Explain system security states with a block diagram. **(06 Marks)**

c. Explain the followings:
(i) Generation shift distribution factor
(ii) Line outage distribution factor **(06 Marks)**

Module-5

9 a. Explain the Z_{build} algorithm for a link addition to the partial network with no mutual coupling. **(08 Marks)**

b. Explain solution of swing equation by Runge-Kutta order 4 method. **(08 Marks)**

OR

10 a. Obtain Z_{bus} by Z_{build} technique for the system shown in Fig.Q10(a). All values are in pu (impedance). Take bus '0' as reference bus. Add the elements in the order ref bus to bus 1, ref bus to bus 2 and lastly bus 1 to bus 2.

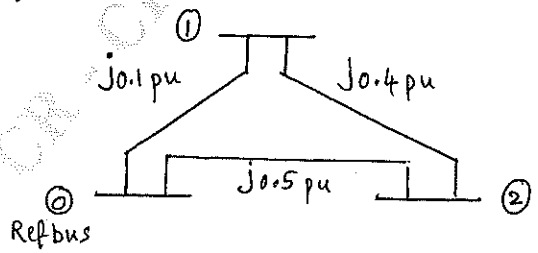

Fig.Q10(a) **(08 Marks)**

b. Explain solution of swing equation by point by point method. **(08 Marks)**

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