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GIET MAIN CAMPUS AUTONOMOUS GUNUPUR – 765022

B. Tech Degree Examinations, December – 2020

(Seventh Semester)

BEEPC7010 / BELPC 7010 – POWER SYSTEM OPERATION & CONTROL
(EE & EEE)

Time: 2hrs

Maximum:50 Marks

The figures in the right hand margin indicate marks.

PART – A: (Multiple Choice Questions)

(1 x 10= 10 Marks)

- a. The per unit value of a 4 Ohm resistor at 100 MVA base and 10kV bus voltage is
 (i) 4 p.u (ii) 2 p.u
 (iii) 40 p.u (iv) 0.4 p.u
- b. For n bus power system , size of Y bus matrix is
 (i) (n-1) X (n-1) (ii) (n-1) X (n-2)
 (iii) (n-2) X (n-2) (iv) n X n
- c. The slack bus has to be a
 (i) PV bus (ii) PQ bus
 (iii) QV bus (iv) No constraint
- d. How is the voltage and frequency controlled in automatic generation control
 (i) By controlling the excitation (ii) By controlling the turbine
 (iii) Turbine speed control for voltage and excitation and control for frequency (iv) Excitation control for voltage and turbine speed control for frequency
- e. What is the unit of transmission loss coefficient
 (i) MW (ii) (MW)⁻¹
 (iii) Unitless (iv) (MW)²
- f. For the economic point of view , a power system should have a load factor
 (i) About 0.2 (ii) About 0.5
 (iii) About 1 (iv) About 2.5
- g. Tie-line bias control is used in
 (i) study of power system stability (ii) study of voltage control
 (iii) study of load frequency control (iv) none of these
- h. A coherent area is called a control area in which the frequency is assumed to be
 (i) Same throughout in static conditions only (ii) Same throughout in dynamic conditions only
 (iii) Same throughout in static and dynamic conditions (iv) Variable throughout static and dynamic conditions
- i. Equal area criterion of stability is applicable to
 (i) A machine infinite bus system only (ii) A machine infinite bus and a two machine system
 (iii) A multi machine system (iv) None of these
- j. Which one of the following enhances the transfer stability of a system the maximum
 (i) Proper choice of make and break capabilities of circuit breaker (ii) Installation of 3 pole auto reclose circuit breaker
 (iii) Installation of single pole auto reclose circuit breaker (iv) All of the above

PART – B: (Short Answer Questions)

(2 x 5 = 10 Marks)

Q.2. Answer ALL questions

- a. Give the advantage of Newton -Raphson method
- b. What is single line diagram ? Give its advantages
- c. What is the need for large mechanical force in speed governing system
- d. What is the use of tie- line in power system?
- e. What is power system stability?

PART – C: (Long Answer Questions)

(6 x 5 = 30 Marks)

Answer ANY FIVE questions

Marks

3. The parameter of the 4 bus systems are as under (6)

Line starting bus	Line ending bus	Line impedance	Line charging admittance
1	2	$0.2+j0.8$	$j0.02$
2	3	$0.3+j0.9$	$j0.03$
2	4	$0.25+j1.0$	$j0.04$
3	4	$0.2+j0.8$	$j0.02$
1	3	$0.1+j0.4$	$j0.01$

Draw the network and find bus admittance matrix

- 4. With a neat flow chart explain the computational procedure for load flow solution using Newton Raphson iterative method when the system contains all type of buses (6)
- 5. Discuss the various constraints in unit commitment (6)
- 6. Write the algorithm for iterative solution of economic dispatch without and with losses coordinated (6)
- 7. Explain AGC of multi area system ALFC (6)
- 8. Explain tie line bias control of two area system (6)
- 9. Derive swing equation and discuss the importance of stability studies in power system planning and operation (6)
- 10. Explain in detail -equal area criterion for stability (6)

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