

# C.U.SHAH UNIVERSITY

## Winter Examination-2018

Subject Name : Inter Connected Power System

Subject Code : 4TE07ICP1

Branch: B.Tech (Electrical)

Semester : 7

Date : 01/12/2018

Time : 10:30 To 01:30

Marks : 70

Instructions:

- (1) Use of Programmable calculator & any other electronic instrument is prohibited.
  - (2) Instructions written on main answer book are strictly to be obeyed.
  - (3) Draw neat diagrams and figures (if necessary) at right places.
  - (4) Assume suitable data if needed.
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**Q-1 Attempt the following questions: (14)**

- a) The Langragian multiplier is a term related to co-ordination equation. The above statement is True/False. (Select the proper option)
- b) The incremental fuel cost ( $dc_i/dP_{gi}$ ) is useful for calculation of plant output. The above statement is True/False. (Select the proper option)
- c) Name the city where state load dispatch centre of Gujarat is located.
- d) State the location of 400 kV Substation in Surendranagar District.
- e) If a Patton's security function value is more than MTIL then unit schedule is ----- (modified/unchanged.)
- f) Mean time to repair is represented by \_\_\_\_\_. (Tup/Tdown)
- g) In the CONTROL AREA All the generators speed up and slow down together. The above statement is True/False. (Select correct option)
- h) For inter state power transfer the critical parameter for monitoring is \_\_\_\_\_. (Frequency/Voltage)
- i) State the name of any two hydro power plant located in Gujarat.
- j) State the name of any two thermal power plant located in Gujarat.
- k) State the name of any two private generating units company in Gujarat.
- l) State the location of any two solar power plant in Gujarat.
- m) Governor control system is \_\_\_\_\_ (fast/slow) than Excitation control system.
- n) State the function of Governor in Thermal Power Station Operation.

**Attempt any four questions from Q-2 to Q-8**

**Q-2 Attempt all questions (14)**

- (a) What is cascaded tripping ? Explain with suitable example. (7)
- (b) List the issues related to design of islanding. (7)

**Q-3 Attempt all questions (14)**

- (a) Describe the cost curve for a generating unit. Explain its significance. (7)
- (b) Derive the Co-ordination equation for n no. of generating units delivering (7)



electrical power to the load.

**Q-4 Attempt all questions (14)**

- (a) State and explain Patton's Security Function. Also discuss MTIL. (7)
- (b) Derive the equation for determining the probability of failure / running of generating unit. Discuss its importance. (7)

**Q-5 Attempt all questions (14)**

- (a) Draw a neat sketch and explain turbine speed governing system. (7)
- (b) State the function of load dispatch centre. (7)

**Q-6 Attempt all questions (14)**

- (a) The output of each unit and plant output for particular value of incremental fuel cost is shown in the table. Draw the graph of (1) Plant output vs. Plant  $\lambda$  (2) Plant output vs. Unit output with suitable scale. The governing equations are  $dC_1/dP_{G1}=0.20 P_{G1}+40$ ,  $dC_2/dP_{G2}=0.25 P_{G2}+30$  [Use Graph Papers] (8)

Plant $\lambda$ , Rs/MWh	Unit 1 $P_{G1}$ , MW	Unit 2 $P_{G2}$ , MW	Plant Output ( $P_{G1} + P_{G2}$ ), MW
35	20.0	20.0	40.0
44	20.0	56.0	76.0
50	50.0	80.0	130.0
55	75.0	100.0	175.0
60	100.0	120.0	220.0
61.25	106.25	125.0	231.25
65	125.0	125.0	250.0

- (b) State the advantages and disadvantages of inter connected system. (6)

**Q-7 Attempt all questions (14)**

- (a) A 100 MVA Synchronous generator operates on full load at a frequency of 50 Hz . The load is suddenly reduced to 50 MW. Due to time lag in governor system , the steam valve begins to close after 0.4 second. Determine the change in frequency that occurs during this time.  $H=5$  Kw-sec /kVA of generating capacity. (7)
- (b) Briefly explain the dynamic programming method. (7)

**Q-8 Attempt all questions (14)**

- (a) Describe the necessary steps for acquiring energy certification from the Gujarat state. (7)
- (b) With usual notations derive the mathematical model of turbine speed governing system. (7)

