Total No. of Questions : 8]

SEAT No. :

PB2266

[Total No. of Pages : 2

[6263]-104
B.E. (Electrical Engineering)
POWER SYSTEM OPERATION & CONTROL
(2019 Pattern) (Semester - VII) (403141)

Time : 2½ Hours] *[Max. Marks : 70*

Instructions to the candidates:

1) ***Answer Q. 1 or Q. 2, Q. 3 or Q. 4, Q. 5 or Q.6, Q. 7 or Q. 8.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right indicate full marks.***
4) ***Assume suitable additional data, if necessary.***
5) ***Use of non-programmable calculator is allowed.***

Q1) a) What is control area concept? Define control area error. **[4]**

b) Develop the block diagram of the load frequency control (LFC) of a single area system. **[6]**

c) Explain clearly about proportional plus integral LFC with a block diagram. **[8]**

OR

Q2) a) Explain the necessity of maintaining the constant frequency of the system. **[4]**

b) Explain droop characteristics of the speed governor system. **[6]**

c) Derive transfer function of speed governor system used in single area load frequency control. **[8]**

Q3) a) Discuss operating cost of thermal unit? What is incremental cost curve.**[3]**

b) A generating unit has two 200 MW units whose input cost data is as under

$F1 = 0.004\ P_1^2 + 2.0\ P_1 + 80$ Rs/hr

$F2 = 0.006\ P_2^2 + 1.5\ P_2 + 100$ Rs/hr

For a total load of 250 MW find the load division between the two units for economic operation. **[6]**

c) Derive the expression for optimal system operation considering transmission loss (penalty factor) for economic load Dispatch (ELD).**[8]**

OR

P.T.O.

Q4) a) What is the concept of unit commitment in the optimal operation of power system? **[3]**

b) With an example, explain the priority list method for unit commitment. **[6]**

c) Determine the saving in fuel cost in Rs/hr for the economic distribution of a total load of 225 MW between the two units with IFCs **[8]**

$dC_1/dP_{g1} = 0.075\ P_{g1} + 15$ Rs/hr

$dC_2/dP_{g2} = 0.085\ P_{g1} + 12$ Rs/hr

Compare with equal distribution of the same total load.

Q5) a) State the advantages of interconnection of power system. **[4]**

b) Write a short note on power pool? **[6]**

c) Explain: **[8]**

i) Diversity interchange

ii) Energy banking

OR

Q6) a) Explain the concept of power pool? **[4]**

b) Discuss the economy interchange between interconnected utilities **[6]**

c) Explain:

i) Capacity Interchange. **[8]**

ii) Interchange evaluation with unit commitment.

Q7) a) Define Voltage stability? Write equation for active power and reactive power for stability. **[3]**

b) Plot a typical P-V curve and write the observations form PV curve. **[6]**

c) Explain problem associated with voltage instability in power system. **[8]**

OR

Q8) a) Discuss the causes of voltage collapse. **[3]**

b) Write a short note on Q-V curve. **[6]**

c) Explain the following voltage stability indices. **[8]**

i) Line stability factor (LQP)

ii) Line stability index (LSI)

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