PVP 17

Code: 17**EEPC2T2**

I M.Tech - II Semester - Regular Examinations - AUGUST 2018

ECONOMIC OPERATION OF POWER SYSTEMS
(POWER SYSTEM & CONTROL)

Duration: 3 hours Max Marks: 60

Answer the following questions.

1. A two-plant system having a steam plant near the load centre and hydro plant at a remote location. The load is 500MW for 16 hours a day and 350MW for 8 hours a day. The characteristics of the units are

   $C_1 = 120 + 45P_G + 0.075P_G^2$ Rs/hr

   $w_2 = 0.6P_G + 0.00283P_G^2$ m^3/sec

   Loss coefficient, B_{22}=0.002MW^{-1}

   Calculate the generation schedule, daily water used by hydro plant and daily operating cost of thermal plant for γ_j = 80 Rs/m^3-hr. 15 M

(OR)

2. Explain how the condition for economic generation of steam and hydro plants for short term scheduling is obtained. 15 M

3. a) Explain the procedure for optimum schedule using the lambda iteration method. 7 M

b) The fuel inputs to two plants are given by 8 M

$F_1 = 0.015P_1^2+16P_1+50$

$F_2 = 0.025P_2^2+12P_2+30$

The loss coefficients of the system are given by $B_{11} = 0.005$, $B_{12} = -0.0012$ and $B_{22} = 0.002$. The load to be met is 200MW, **Estimate** the economic operating schedule and the corresponding cost of generation is

i) The transmission losses are coordinated

ii) The losses are included but not coordinated.

(OR)

4. Calculate the economic operating point for three units with the following incremental fuel cost characteristics 15 M

$$\frac{d_1}{d_1} = 7.92 + 0.003124P_1$$

$$\frac{d_2}{d_2} = 7.85 + 0.00388P_2$$

$$\frac{d_3}{d_3} = 7.97 + 0.00964P_3$$

when delivering a total load of 850MW. Also calculate the dispatch for a total load of 900 MW by using the participation factor method.

5. a) Discuss the importance of combined load frequency control and economic dispatch control with a neat block diagram. 8 M

b) What are the objectives of automatic generation control and explain how those are achieved? 7 M

(OR)

6. a) Draw the block diagram for a two area LFC with integral controller blocks and explain each block. 8 M

b) Explain the features of Automatic Generation Control (AGC). 7 M

7. a) Give the step-by-step procedure to solve unit commitment problem using priority-list method. 8 M

b) Solve the following unit commitment problem using priority list method for a system load of 800 MW. 7 M

Unit Number	Units Loading		Unit Data (MBtu/hr)	Fuel cost (Rs/MBtu)
	Min	Max		
1	100	400	$600+7P_1+0.006P_1^2$	1.1
2	50	300	$400+8P_2+0.010P_2^2$	1.2
3	150	500	$500+6P_3+0.008P_3^2$	1.0

(OR)

8. a) Explain optimal power flow solution using Linear programming method. 8 M

b) Differentiate between Economic dispatch and Unit commitment. 7 M