

University Roll No.: \_\_\_\_\_

YMCA UNIVERSITY OF SCIENCE AND TECHNOLOGY, FARIDABAD

B.Tech. 8th Semester Examination (Under CBS) DEC: 2018

Power System Operation and Control

Paper: EL-406

Time: - Three Hours

Maximum Marks:-60

Note: - (i) Question no.1 is compulsory from Part-I.

(ii) Attempt any four questions from Part-II.

**PART-I – (2x10 = 20 Marks)**

- Q1 a) What are the major control loops used in large alternators?  
b) What is unit commitment and its solution methods?  
c) What do you mean by load shedding?  
d) Enumerate the advantage of spinning reserve.  
e) What is penalty factor?  
f) Draw the state space model of two area system.  
g) Is the cost of fuel directly proportional to power outputs? Explain.  
h) What are the different methods of voltage control?  
i) Explain the need of integral controller in LFC.  
j) What is GRC and its advantage in AGC.

**PART-II**

- Q2) Draw and explain the modeling of speed governing system and draw its block diagram representation. (10)
- Q 3 a) Explain the effect of speed governor dead band on AGC. (5)  
b) Explain various constraints in unit commitment. (5)
- Q4 a) Derive the short range fixed head hydrothermal scheduling. (5)  
b) Explain the need of economic dispatch control. (5)
- Q5 Three thermal units of the system have the following cost curves:  
 $F(P_{g1})=0.004 P_{g1}^2+7.2P_{g1}+350$  Rs/hr  
 $F(P_{g2})=0.0025 P_{g2}^2+7.3P_{g2}+500$  Rs/hr  
 $F(P_{g3})=0.003 P_{g3}^2+6.74P_{g3}+600$  Rs/hr
- Where  $P_g$  is in MW. Determine the economic operating schedule of the plants and compare the cost of this to the case when the generators share the load equally if  $P_D=450$  MW. (10)
- Q6 a) What are the advantages and disadvantages of series compensation? (5)  
b) Write a short note on AVR. (5)
- Q 7 a) Derive Transmission loss formula using loss coefficients. (5)  
b) A 200 MW generator has a regulation parameter R of 6%. By how much will the turbine power increase if the frequency drops by 0.1 Hz with the reference unchanged? (5)