Roll No. | | | | | | | | | | | | | Total No. of Pages : 02

Total No. of Questions : 09

B.Tech.(Electronics & Electrical) (2011 Onwards E-II)

B.Tech.(Electrical & Electronics) (2013 & Onwards E-II) (Sem.–7,8)

GENERATION AND CONTROL OF POWER

Subject Code : BTEEE-804A

M.Code : 71963

Time : 3 Hrs. Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1) Answer the following in short :

a) Draw the input output characteristics of a hydroelectric plant.

b) Differentiate between fixed and operating costs of power plants.

c) How is incremental cost calculated?

d) What is unit commitment ?

e) Write down the transmission loss equation for a system with two units.

f) Why there is a need of reactive power?

g) Define load frequency control?

h) What is automatic load dispatching?

i) What do you mean by network sensitivity?

j) Define per unit system.

SECTION-B

2) Write a short note on economic operation of power system.

3) In a system consisting of two generating units connected through a transmission line, the incremental costs are :

$$\frac{dC_1}{dP_1} = 0.16 P_1 + 32$$

$$\frac{dC_2}{dP_2} = 0.24 P_2 + 36$$

The system is operating on economic dispatch with $P_1 = P_2 = 100$ MW and $\frac{\partial P_1}{\partial P_2} = 0.2$.

Find the penalty factor of plant 1.

4) What is unit commitment and list the constraints in unit commitment problem?

5) A 250 MW, 60 Hz turbine generator set has a speed regulation of 5% based on its own rating. The generator frequency decreases from 60 Hz to a steady state value of 59.7 Hz. Determine the increase in the turbine power output.

6) Discuss the various factors which affect power system security.

SECTION-C

7) A region has a maximum demand of 500 MW at a load facor of 50%. The load duration curve can be assumed to be a triangle. The utility has to meet this load by setting up a generating system which is partly hydro and partly thermal. The costs are as under :

Hydro plant : Rs. 7200 per kW per annum + operating expenses Rs. 0.36 per kWh.

Thermal plant Rs. 3600 per kW per annum + operating expenses Rs. 1.56 per kWh.

Determine the capacity of hydro plant, capacity of thermal plant, energy generated annually by each and overall generation cost per kWh.

8) Explain briefly :

a) Load frequency control

b) Automatic Voltage Regulator

9) Explain briefly :

a) Modelling of DC links

b) Solution techniques of AC-DC power flow equations.

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.