

**B.TECH. SEM -VII ELECTRICAL 2014 COURSE (CBCS) :
SUMMER - 2018**

SUBJECT: OPERATION AND CONTROL OF POWER SYSTEM

Day : Tuesday
Date : 22/05/2018

S-2018-2490

Time : 02.30 PM TO 05.30 PM
Max Marks : 60

N.B. :

- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.
- 3) Assume suitable data, if necessary.

Q.1 a) Derive the swing equation and prove that it is nonlinear second order (06) differential equation.

b) What are the methods for improving the transient stability limit of power (04) system?

OR

a) What is transient stability? Explain the factors affecting the transient stability (05) in detail.

b) Explain equal area criteria for sudden loss of one of parallel lines. (05)

Q.2 a) Write short note on: (05)

- i) Unit Commitment
- ii) Economic load dispatch

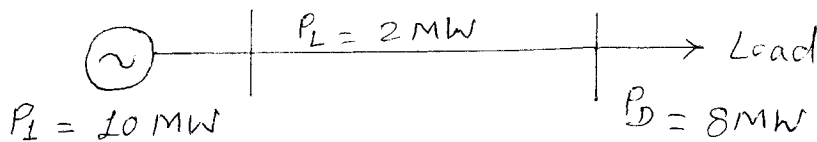
b) Derive the transmission loss function of two plant system. (05)

OR

a) What are the different methods of unit commitment? Explain dynamic (05) programming method of unit commitment in detail.

b) Determine the incremental cost of received power and penalty factor of the (05) plant shown in fig.below,if the incremental cost of production is,

$$\frac{dF_1}{dP_1} = 0.1 P_1 + 3.0 \text{ Rs./MWhr}$$



Q.3 a) Draw block diagram representation of two area load frequency control with (05) PI controller.

b) With block diagram, explain load frequency control with generation rate (05) constraints.

OR

a) Sketch and compare the dynamic response of load frequency control of an (05) isolated power system with and without integral control action.

b) Define governor dead band. What is its effect on automatic generation (05) control?

P. T. O.

- Q. 4** a) Explain reactive power generation by synchronous machine. (05)
b) Explain advantages of shunt compensation and also state the location of capacitor in shunt compensation. (05)

OR

- a) Explain the loading capability curve of a synchronous generator. (05)
b) Write brief note on sub-synchronous resonance. (05)

- Q. 5** a) What is FACT technology? What are its applications in power system? (05)
b) Explain Unified Power Flow Controller (UPFC) with diagram. (05)

OR

- a) Explain the principle of working of Static Compensator (STATCOM) in detail. (05)
b) Explain the principle of operation of SSSC in detail. (05)

- Q. 6** a) Discuss the advantages of interconnected power system. (05)
b) Write short note on Energy banking. (05)

OR

- a) Discuss the concept of interchange evaluation with unit commitment. (05)
b) What is the power pool in energy exchange? (05)

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