Q.P. Code: 16EE228 **R16**

Reg. No: | | | | | | | | | | |

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech IV Year I Semester Regular Examinations Nov/Dec 2019

POWER SYSTEM OPERATION AND CONTROL

(EEE)

Time: 3 hours Max. Marks: 60

(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

1 **a** Explain with diagram the physical interpretation of co-ordination equation. **6M**

b Derive the condition for economic scheduling of generation in a plant by neglecting the transmission losses. **6M**

OR

2 The fuel cost curve of two generators as follows: **12M**

$C_1 = 0.06P_{12} + 35\ P_1 + 625$ Rs/hr

$C_2 = 0.05P_{22} + 30\ P_2 + 175$ Rs/hr

If the total load supplied is 550MW, find the optimal dispatch with and without considering the generator limits and also comment about the incremental cost of both cases.

$35MW < P_1 < 175MW$

$35MW < P_2 < 175MW$

UNIT-II

3 Derive the co-ordination equation for the optimal scheduling of Hydro – Thermal interconnected power systems. **12M**

OR

4 Derive solution for short term hydro thermal scheduling using Kirchmayer' method. **12M**

UNIT-III

5 Derive and explain mathematical modeling of speed governing system. **12M**

OR

6 Two turbo alternators rated for 110MW and 210MW have governor drop characteristics of 5% from no load to full load. They are connected in parallel to share a load of 250MW. Determine the load shared by each machine assuming free governor action. **12M**

UNIT-IV

7 Two control areas connected by a tie line have the following characteristics. **12M**

Area 1	Area 2
R=0.01 pu	R=0.02pu
D=0.8pu	D=1pu
Base MVA=2000	Base MVA=500

A load change of 100 MW(0.2 pu) occurs in area 2. Find the new steady state Frequency and what is the change in tie line flow? Assume both areas were at nominal of 60 Hz at the time of begin.

OR

8 Give typical block diagram for a two-area system inter connected by tie line and explain each block. **12M**

UNIT-V

9	**a**	What is the role of reactive power in the power system? Discuss in detail about the generation and absorption of reactive power in power system components.	**6M**
	b	Distinguish shunt and series compensations.	**6M**

OR

10		Explain the operations of synchronous condenser and mention its applications in power systems and derive the expression for capacity of synchronous condenser.	**12M**

*** END ***