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SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)

B.Tech III Year II Semester Regular Examinations August-2022

POWER SYSTEM OPERATION AND CONTROL

(Electrical and Electronics Engineering)

Time: 3 hours

Max. Marks: 60

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

UNIT-I

- 1 a Briefly explain about an incremental fuel cost of thermal power station. L2 6M
 b The fuel cost of two units are given by, $C_1=1.5+20P_{G1}+0.1P_{G1}^2$ Rs/hr, L3 6M
 $C_2=1.9+30P_{G2}+0.1P_{G2}^2$ Rs/hr. If the total demand on the generation is 200MW, find the economic load scheduling of the two units.

OR

- 2 a Define objective function. L1 6M
 b Explain about optimum generation allocation with line loss neglected. L2 6M

UNIT-II

- 3 Derive the mathematical formulation of hydro-thermal scheduling. L3 12M

OR

- 4 a What is inter connected grid system? L1 6M
 b Consider a steam station with two units the input-output characteristics being specified by $F_1=80+8P_1+0.024P_1^2$ L3 6M
 $F_2=120+6P_2+0.04P_2^2$

In scheduling a load of 100MW by equal incremental cost method, the incremental cost of unit 1 is specified wrongly by 10% more than the true value while that of unit 2 is specified by 6% less than the true value Find

- (i) The change in generation schedules and
 (ii) The change in the total cost of generation.

UNIT-III

- 5 Derive the mathematical modeling of speed governor system. L3 12M

OR

- 6 a Draw the block diagram of steam turbine and explain it in detail. L1 6M
 b A 100 MVA synchronous generator operates on full load at a frequency of 50 Hz. L3 6M
 The load is scheduled to 50 MW. Due to time lag in the governor system, the steam valve begins to close after 0.4 seconds. Determine the change in frequency that occurs in this time. $M = 5$ KW-S/KVA of generator capacity.

UNIT-IV

- 7 Draw the block diagram representation of a single area system and deduce the expression for the steady state response of the system. L1 12M

OR

- 8 a Explain about load frequency control and economic dispatch control. L2 6M
 b Define control area. L1 6M

UNIT-V

- 9 Explain clearly what do mean by compensation of a transmission line and discuss briefly different methods of compensation. L2 12M

OR

- 10 A load of $(15+j10)$ MVA is supplied with power from a generating station from a line at 110KV 3 phase 50HZ. The line is 100Km length. The line is represented by π model with the parameters- $R=26.4\text{ohms}$, $X=33.9\text{ohms}$, $B=219*10^{-6}$ voltage at the generated in 116KV. Determine the power supplied by the generating station. L3 12M

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