Code: 9A02603 **R09**

B.Tech III Year II Semester (R09) Supplementary Examinations December/January 2015/2016

POWER SYSTEM OPERATION & CONTROL

(Electrical and Electronics Engineering)

Time: 3 hours Max Marks: 70

Answer any FIVE questions

All questions carry equal marks

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1 The fuel cost curve of two generators are given as
$C1 = 0.06P_1^2 + 35P_1 + 625$
$C2 = 0.005P_2^2 + 30P_2 + 175$
If the total load supplied is 550 MW, find the optimal dispatch with and without considering the generator limits : 35 MW ≤ P_1 ≤ 175 MW
33 MW ≤ P_2 ≤ 600 MW
And also comment about the incremental cost of both cases.

2 A system consists of two generating plants with fuel costs of:
$C1 = 0.03\ P_1^2 + 15\ P_1 + 1.0$ Rupees/hour
$C2 = 0.04\ P_2^2 + 21\ P_2 + 1.4$ Rupees/hour
The system operates on economical dispatch with 120 MW of power generation by each plant. The incremental transmission loss of plant -2 is 0.15. Find the penalty factor of plant -1.

3 Describe the objective function to minimize the cost of generation of hydro thermal scheduling.

4 Derive transfer function model of Reheat type of steam turbines.

5 Explain different steps involved in mathematical modeling of a Speed Governor.

6 Explain loop response of a ALFC system with proportional plus integral controllers

7 Differentiate between Series and Shunt compensations with proper examples

8 (a) Explain the characteristics of wholesale electricity market.
(b) Briefly explain about sequential and simultaneous markets.

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