Complex Engineering Problem/Activity

CLOs and PLOs for Complex Engineering Problem (Theory+ Lab= 10+5)

Please state CLOs and PLOs addressed in the complex engineering problem along with domain and level. These are the CLOs from the theory/lab course which are already defined.

CLOs		Description	Domains & Levels	PLOs, Levels
CLO1	Theory	Design of an overhead high voltage transmission line.	Cognitive, 6	PLO6 High
CLO2	Lab	Demonstrate the application of basic compensation techniques in the planning of an interconnected power system	Psychomotor, 3	PLO3 Medium

Problem Statement

It is proposed to transmit 100 MW at 0.9 power factor lagging over a distance of 200 km from Mangla to Lahore. Under full load conditions, the limit for voltage regulation and efficiency is 15% and 95% respectively. Work out the following details of transmission line:

1. Select line voltage and number of circuits

2. Choose appropriate conductor and span for this line

3. Select a suitable value of inter-phase spacing and a suitable configuration of conductors

4. Calculate line parameters. Estimate the line efficiency and voltage regulation for full load conditions.

5. Select a suitable compensation equipment to increase the capacity of line to a maximum level.

6. Determine the capacity of shunt compensation equipment to improve the receiving end power factor to 0.95 lagging. You may make suitable assumptions, but they must be clearly mentioned.

7. Use a simulation tool to demonstrate the effectiveness of the designed shunt compensation.

Complete Evaluation Rubrics

Rubrics	Unsatisfactory ,1	Satisfactory,1	Good,3	Very Good,4	Comprehensive,5
Literature Review (Theory)	No apparent literature review	Mediocre research which may or may not lead to an adequate solution	Good research	Very good research, leading to a successful solution	Contains all the information needed for solving the problem
Design Methodology (Theory)	No planned method	Ill structured methodology	Good methodolo gy	Very good methodology	Comprehensive methodology
Development of Simulation Model (Lab)	Model was not implemented	Model was implemented with approximations	Model was adequately implement ed with reasonably accuracy	Model was adequately implemented with reasonably accuracy, and few reactive power compensatio n methods applied	Model was comprehensive implemented with high accuracy and all reactive power compensation methods applied
Report (Theory)	No handout	Mediocre information which may or may not lead to a solution	Good informatio n	Very good information organized well, that could lead to a good solution	All of the necessary information clearly organized for easy use in solving the problem
Conclusions (Theory)	Conclusions were not written or entirely wrong	Conclusions were presented but not adequately	Conclusion s were presented in a good manner	Conclusions were presented quite well	Conclusions were reasonably presented