Centre for Energy Studies

Major (ESL796 V-517) **MM: 40**

Date: 24-11-2016 (8.00 AM-10.00 PM)

1) All questions are compulsory

2) Assume any data if required

1. A) Explain the impact of large-scale renewable energy integration on power system operations.
   B) Discuss the uncertainty handling in load flow using boundary power flow approach. *(5+5)*

2. A) Discuss the difference between saddle node bifurcation and Hopf's bifurcation in stability analysis. For which one of them continuation power flow is utilized?
   B) Explain steps involved in continuation power flow method. *(5+5)*

3. A) State the advantages of deregulation. Explain the various levels of deregulation.
   B) Draw and explain the block diagram for single area AGC controlled system. *(5+5)*

4. A) State the difference between Load flow and State Estimation. Discuss the importance of bad data detection. Also, explain the methods used for bad data detection.
   B) For the following five bus system, formulate an OPF problem and explain how it will be solved using Newton's approach. Consider real power generation as well as voltages as control variable. Objective is to minimize the total cost of generation. *(5+5)*