

# *National Institute of Technology, Hamirpur (HP)*

**Name of the Examination: M.Tech. Power System (Dec., 2020)**

**Branch : Electrical Engineering Semester : First**  
**Course Name : Advanced Relaying and Protection Course Code : EE-613**

**Time: 2 Hours**

**Maximum Marks: 50**

**Note:** Attempt all the questions. Marks allotted for each question are given in bracket. Assume missing data if any suitably.

1. (a) State briefly the various principles of protections used in power system with application. (5)  
(b) State the factors affecting the performance of a power system protection scheme. (5)
2. (a) Explain the typical numerical relay hardware required in numerical relays with the help of a diagram. (5)  
(b) State the frame leakage protection of bus bar with the help of a diagram. (5)
3. (a) State the principle of distance protection, types of distance relays and illustrate the concept of the reach of a relay. (5)  
(b) Explain the differential protection of stator of an alternator with the help of a diagram. State its limitations and mention the ways to minimize such limitations. (5)
4. (a) State the construction and application of a harmonic restraint relay in transformers with diagram. (5)  
(b) State the need of auto reclosing and synchronizing in power system. State under what circumstances auto reclosing is used. (5)
5. (a) Draw and state briefly the block diagram and flow chart for microprocessor based instantaneous overcurrent relay. (5)  
(b) Draw the block diagram for a carrier aided protection of transmission line, briefly stating the function of each carrier aided equipment used in protection. (5)