**Harbin Institute of Technology, Shenzhen**

**Signature from Head of the School**

Question 2. [10 marks] An NTP server B receives server A’s message at 16:34:23.480 bearing a timestamp 16:34:13.430 and replies to it. A receives the message at 16:34:15.725, bearing B’s timestamp 16:34:25.7. Estimate the offset between B and A and the accuracy of the estimate. (10 marks)

**Spring Semester of 2020**

**Distributed Systems Final Assignment**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Question** | **One** | **Two** | **Three** | **Four** | **Five** | **Six** | **Seven** | **Eight** | **Nine** | **Ten** | **Total** |
| **Mark** |  |  |  |  |  |  |  |  |  |  |  |

………………**……密**…**………………**…**…封…………**…**…**…**………线…………………**……………………

Question 1. [10 marks]

Explain in detail how NAT (Network Address Translation) works. Use a diagram to help your explanation. Suppose the organization uses an external IP address 168.12.0.4, and a host, with internal IP address 12.0.60.4 and port number 1234 inside the organization, sends an IP packet to outside web-server with destination IP address 125.12.4.16.

**DEPARTMENT: CLASS: STUDENT ID: NAME:**

Question 5. [60 marks]

Please select one of the topics we learned during the distributed system course and make a survey of the topic. (The survey should be including the latest problem and solution concern of the topic in distributed systems)

…………**……**………………………**密………**…**…………**…**………封………**…**…………**…**………线………………………**………………………

Question 3. [10 marks] In the UNIX file system, a user opens file

“/hitsz/ds/code/example/exam.txt”. Suppose the inode of the root directory (i.e., “/”) is already in the inode-table (in memory).

a) List the steps of resolving path name “/hitsz/ds/code/example/exam.txt” and loading the inode of the file into the inode-table.

b) What is the number of disk accesses required?

Question 4. [10 marks]

What is the difference between a distributed file system and a transaction processing system?

**DEPARTMENT: CLASS: STUDENT ID: NAME**

…………**……**………………………**密………**…**…………**…**………封………**…**…………**…**………线………………………**………………………

**DEPARTMENT: CLASS: STUDENT ID: NAME:**

…………**……**………………………**密………**…**…………**…**………封………**…**…………**…**………线………………………**……………………

**DEPARTMENT: CLASS: STUDENT ID: NAME:**