National University of Computer and Emerging Sciences, Lahore Campus

Course:	Introduction to Cloud Computing	Course Code:	CS-499
Program:	BS (Computer Science)	Semester:	Spring 2018
Duration:	60 Minutes	Total Marks:	40
Paper Date:	27-Feb-18	Weight	15%
Section:	A and B	Page(s):	1
Exam:	Midterm	Reg. No.	

Instruction/Notes:

- Answer all the questions
- Read the questions carefully before answering them
- If you are certain that something is unclear, make a *reasonable assumption*, mention it and answer the question
- All questions carry equal marks

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1. An organization produces 500 GB of data that needs to be processed. The organization owns 20 servers that are each equivalent to an Amazon EC2 instance. An Amazon EC2 instance or the equivalent local server would take 2 hours per GB to process the data. The cost to upload data to Amazon's cloud is $0.10 / GB and the organization has a consistent 20 MB/s connection to the Amazon cloud. The organization needs to decide if it should process the data locally or on the Amazon cloud. Which option is faster? Show how long each option takes.

2. A friend owes me some money (with friends like these….), don't ask why. He's not going to pay me back as he doesn't have cash. However, he has 20 brand new high-end servers that cost approximately what he owes me. I can take the servers and call it even. The servers can handle the expected peak workload for an app that I am about to launch. Should I be satisfied with deploying on these servers from my friend, or should I be thinking about a cloud based deployment?

3. Why is cloud-scale infrastructure provisioning not possible without virtualization?

4. Oversubscription in a particular tier of a data center network is defined as the ratio of the downlink bandwidth to the uplink bandwidth. For example, if each access switch is connected to 5 servers using 1 Gbps connections and has a 4 Gbps uplink to the aggregation tier, then the aggregation tier has an oversubscription of 5:4. You have to interconnect 24 servers at 1 Gbps each, using 12 port Ethernet switches and the aggregation tier can have an oversubscription of 2:1. Design a two tier network using as few switches as possible to achieve the above target.

5. What technical challenge is associated with using a fat-tree topology in the data center Ethernet? Suggest two solutions to this challenge.

6. How is malicious intermediary threat type different from eavesdropping?

7. A security bug is discovered in the MySQL Python API. Who (the cloud provider or the consumer) is responsible to fix this in IaaS, PaaS and Saas settings?

8. Would a VM acquired on an IaaS model provide consistent performance? Why or why not?