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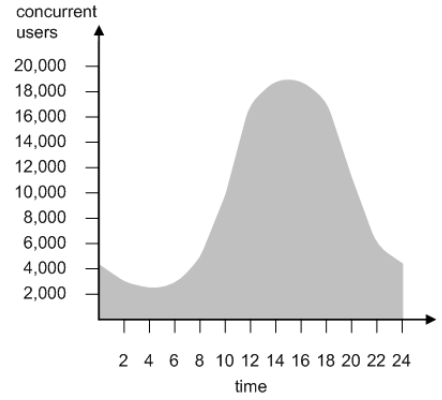
CLOUD BASED ENTERPRISE SYSTEMS (15B22CI521)

Q1. You are the IT manager of a start-up company. Your team has recently built a new Web service that requires a hosting environment comprised of multiple servers. Based on predicted usage estimates, your team produces the following chart illustrating the anticipated number of concurrent users over a typical 24 hour period.



You ask your team to perform an up-front and on-going cost comparison with the following assumptions:

- The purchase cost of one physical server is $14,000
- The leasing cost of one virtual server from a cloud provider is $2,000 per month, labour cost for up-front is $1200.
- the on-premise physical server and the leased virtual server can each support 8,000 concurrent users
- to support the maximum number of predicted concurrent users, three servers will be required
- Bandwidth usage cost in cloud is $1500 fixed, licensing cost is $700, and labour cost ongoing is $1000.

Based on these statistics and assumptions, complete the following table by adding the cost in the comparison table amounts based on the aforementioned considerations.

	cloud computing solution	on-premise solution
up-front costs (one-time)		$62,400
hardware purchase		$42,000
software purchase		$15,000
labor costs		$4,400
ongoing costs (monthly)		$7,200
hardware usage		$0
bandwidth usage		$0
hosting costs		$1,800
insurance costs		$600
licensing costs		$1,800
labor costs		$3,000

Based on these assumptions and based on approximate usage values from the preceding graph, the estimated concurrent usage over an average 24 hour period results in the following values for the number of virtual severs required:

- 10 hours with 1 virtual server
- 4 hours with 2 virtual servers
- 10 hours with 3 virtual servers

Upon reviewing the compared costs, you realize that your team did not consider the possibility of scaling the virtual servers to accommodate the daily fluctuation in concurrent users.

You therefore decide to adjust the *cloud computing solution* column of the comparison table by taking the following additional factors into account:

- the quantity of virtual servers required during different periods of an average day
- an increase of $1,200 in labor costs to configure the scaling parameters

Complete the following table by adding the adjusted amounts based on the aforementioned considerations. (Note that, for the purpose of this exercise, the on-going licensing and labor costs remain unchanged.)

Q2. A cloud provider is deploying a new SaaS product comprised of a cloud service. As part of the deployment, the cloud provider wants to publish a service level agreement (SLA) that provides an availability rating based on its estimated availability over the next 12 months. First, the cloud provider estimates that, based on historical data of the cloud environment, there is a 25% chance that the physical server hosting the cloud service will crash and that such a crash would 2 days before the cloud service could be restored. It is further estimated that, over the course of a 12 month period, there will be various attacks on the cloud service, resulting in a total of 24 hours of downtime. Based on these estimates, what is the availability rating of the cloud service that should be published in the SLA?