

**Answer All the Questions**

1. Consider a scenario where a company X wants to use a cloud service from a provider P. The service level agreement (SLA) guarantees negotiated between the two parties prior to initiating business are as follows: **(6 Marks)**

- Availability guarantee: 99.5% time over the service period
- Service period: 30 days
- Maximum service hours per day: 16 hours
- Cost: INR 3500 per day
- Service credits are awarded to customers if availability guarantees are not satisfied. Monthly connectivity uptime service level are given as:

Monthly UptimeService Percentage	Service Credit
<99.5%	20%
<99%	30%

However, in reality it was found that over the service period, the cloud service suffered five outages of durations: 5 hrs, 30mins, 1hr 30mins, 5mins, and 2hrs 30mins, each on different days, due to which normal service guarantees were violated. If SLA negotiations are honored, compute the effective cost payable towards buying the cloud service.

2. **(5 Marks)**
- (a) OSs use privileged instructions to manage hardware resources like page tables and I/O devices. When executed with a VM on a modern hypervisor providing full hardware virtualization, what happens when a guest OS executes a privileged instruction of this sort? Explain your answer.
- (b) What are the advantages of full hardware virtualization over paravirtualization? Explain in detail with examples
3. What are the important parameters that affect VM migration performance?. Explain in detail about under which workload scenario the specific migration technique works better? Justify your answer. **(4 Marks)**