Introduction

Q1 Define Cloud computing. List how cloud computing will help to address business challenges

Cloud computing is providing different IT services to customers over the Internet. It is the ability to deliver computing service over the Internet to the end-users on-demand or on a pay-as-you-go basis.

Advantages of Cloud Computing in Business

- **Flexibility:** Remote cloud servers offer almost unlimited bandwidth and storage space, which allows businesses to instantly scale up and down their capacities to support growth and cope when website traffic increases. This removes the need to purchase, configure and install equipment on-site.
- **Business Continuity:** By investing in cloud computing, businesses can guarantee reliable disaster recovery and backup solutions without the hassle of setting them up on a physical device.
- **Cost Efficiency: T**he most significant advantage of cloud computing is the IT operational cost savings. Using remote servers removes the need for in-house storage equipment and application requirements, as well as overhead costs such as software updates, management, and data storage.
- **Scalability and Performance:** Cloud technology is designed to be scaled to meet a business's changing IT requirements. As a company grows, it is inevitable that more storage space and bandwidth will be required to cope with increasing traffic to the website. Cloud servers can be deployed automatically to help businesses scale up and down and ensure optimum performance under heavy loads.
- **Automatic Software Updates:** Many cloud service providers offer regular system updates to ensure IT requirements are consistently met. They ensure round-the-clock maintenance of cloud servers – including security updates.

2. Block diagram of Basic Cloud Computing Model. List out various reasons for adopting the cloud.

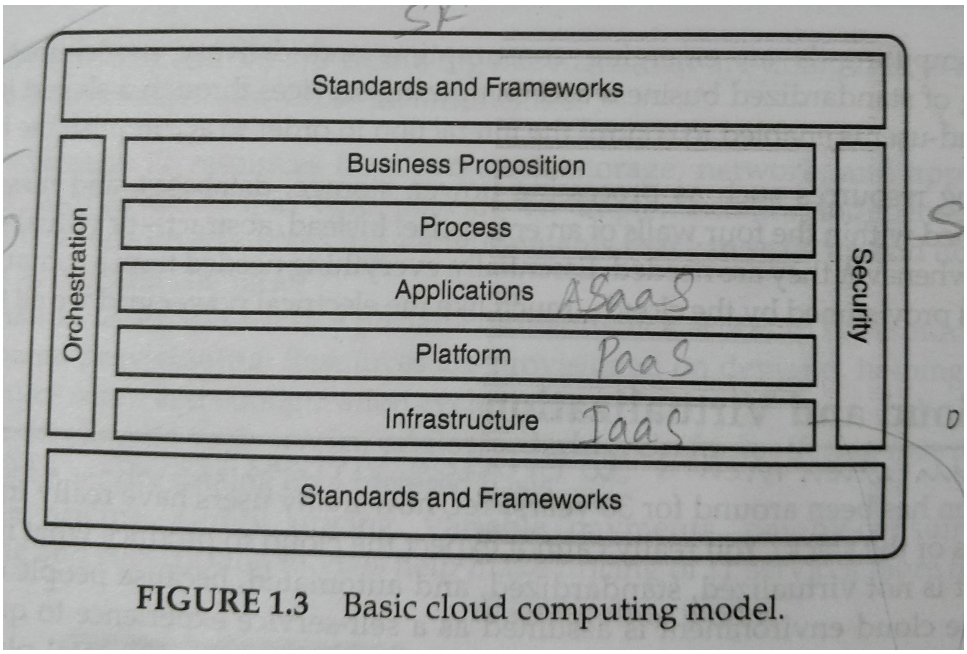

FIGURE 1.3 Basic cloud computing model.

Reasons for adopting the cloud

> 💡 Same as Answer 1: Advantages

Q3 What is virtualization? How virtualization of cloud computing has benefited various organizations.

Virtualization

Virtualization is the process of running a virtual instance of a computer system in a layer abstracted from the actual hardware. Most commonly, it refers to running multiple operating systems on a computer system simultaneously.

Benefits

- Reduced operating costs.

- Minimal downtime
- Increase in IT productivity & efficiency
- Faster provisioning of applications and resources.
- Greater business continuity and disaster recovery.
- Simplified data center management.
- High availability
- Increased efficiency

Q4 List and explain the initiatives that provide cloud dynamic infrastructure

- **Service management:** Provide visibility, control, and automation across all the business & assets to deliver higher-value services.
- **Asset-Management:** Use of asset management solutions to maximize the value of business assets.
- **Virtualization and Consolidation:** Reduces costs, improve responsiveness, fully utilize resources.
- **Information Infrastructure:** Helps in achieving information compliance, availability, retention, and security goals.
- **Energy-Efficiency:** Addresses energy, environmental, and sustainability challenges and opportunities.
- **Security:** Provide risk management, end-to-end industry customized governance.
- **Resilience:** Maintain business & IT operations continuously while adapting & responding to risks and opportunities.

Q5 Barriers in Implementing Cloud Computing

- **Requires good speed internet with good bandwidth:** To access your cloud services, you need to have a good internet connection always with good bandwidth to upload or download files to/from the cloud

- **Downtime:** Since the cloud requires high internet speed and good bandwidth, there is always a possibility of service outage, which can result in business downtime. Today, no business can afford revenue or business loss due to downtime or slow down from an interruption in critical business processes.
- **Limited control of infrastructure:** Since you are not the owner of the infrastructure of the cloud, hence you don’t have any control or have limited access to the cloud infra.
- **Restricted or limited flexibility:** The cloud provides a huge list of services, but consuming them comes with a lot of restrictions and limited flexibility for your applications or developments. Also, platform dependency or ‘vendor lock-in’ can sometimes make it difficult for you to migrate from one provider to another.
- **Ongoing costs:** Although you save your cost of spending on whole infrastructure and its management, on the cloud, you need to keep paying for services as long as you use them. But in traditional methods, you only need to invest once.

Q6 Explain the types of applications where cloud can be implemented and cannot be implemented?

Suitable

- Cloud favours web applications and interactive application and services with low availability requirements and short life spans. Eg: Enterprise marketing campaigns need quick delivery of a promotion.
- Cloud suitable applications are those that are modular, isolated workloads, one-time batch processes, media distribution, packages like E-mail & collaborative business networks.
- Cloud suitable projects are R&D projects, prototyping of new applications, design models & those which scale horizontally on small servers — that is addid of more small servers rather than increasing single server’s computational capacity.

Not Suitable

- Clouds are not suitable for mission-critical & core business & their applications, transaction processing that depend on data that are restricted to the organisation.
- Applications that run 24x7 365 days with steady demand, those which consume significant memory, databases, are not suitable for cloud.
- Cloud is not suitable for applications that scale vertically on single servers — that is, by increasing a server’s computational capacity rather than adding more servers.\