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* Essential characteristics of cloud computing :-

1] Broad Network Access :-

→ cloud services are accessible over the network through standard mechanisms enabling access via various devices like mobile phones, tablets and laptops.

2] Rapid Elasticity :-

→ cloud resources can be quickly scaled up or down to meet demand, providing flexibility to accomodate varying workloads.

3] Measured services :-

→ cloud systems automatically control and optimize resource use by leveraging a metering capability, often on a pay-per-use or charge-per-use basis.

4] On-Demand Self-Services :-

→ User can provision computing resources as needed automatically, without requiring human interaction with service providers.

5] Resource Pooling :-

→ Multiple customers share a common pool of resources, dynamically assigned and reassigned according to demand, providing a multi-tenant model with different physical and virtual resources.

* Service Models :-

1] Software as a Service (SaaS):
→ Delivers software applications over the internet, typically on a subscription basis, eliminating the need for local installation and maintenance.

2] Function as a Service: (FaaS):
→ A serverless computing model that allows developers to run individual functions or pieces of code without managing server infrastructure.

3] Platform as a Service (PaaS):-
→ Provides a platform allowing customers to develop, run, and manage applications without the complexity of building and maintaining the underlying infrastructure.

4] Container as a Service (CaaS):
→ offers container-based virtualization where containers can be used to deploy, manage, and scale applications. Providing an abstraction layer between applications and infrastructure.

5] Infrastructure as a Service (IaaS):
→ Provides virtualized computing resources over the internet, including servers, storage and networking, enabling customers to rent infrastructure on a flexible and scalable basis.

* Deployment Models :-

1] Public cloud :
→ cloud services provided over the public internet and available to anyone who wants to purchase them, offering scalable and elastic resources.

2] Private cloud :-
→ cloud infrastructure operated solely for a single organization, offering enhanced security and control over data and applications.

3] Hybrid cloud :-
→ combines public and private clouds, allowing data and applications to be shared between them, providing flexibility and optimal resources utilization.

4] Community cloud :-
→ A cloud infrastructure shared by several organizations with common concerns, such as security, compliance or jurisdiction, and managed either internally or by a third party.