Ans 1 – ① On demand self service
② Broad Network Access
③ Resource Pooling and Rapid Elasticity

⇒ Cloud differs from Traditional on-premise :

① cost – pay only for the resources used
② Scalability – with minimal effort
③ Maintenance & Upgradation – managed by service provider to handle support.
④ Security & Reliability. – robust mechanisms and disaster recovery solutions.

⇒ I would prefer (SaaS) - Software as a Service which provides immediate access to functional, cost efficient tools and help startup focus on core business activities rather than IT.

Ans 2 – ① publisher – entity that produces and sends real time updates.
② Subscriber – entity that recieve updates
③ Message broker – recieves message like RabbitMQ, AWS SNS, etc..

⇒ Steps to set up Publisher – Subscriber model –

1 – setting up publisher – create logic using JSON format over HTTP.

2 – setting up subscriber – display notification, UI.

3 – Setting up message brokers – choose RabbitMQ, configure and ensure setup.

4 – Communication mechanism – message : JSON, protocol : HTTP, acknowledgements.

Ans 3 – Types of Virtualization –

(1) CPU – allows multiple OS and applications to share single CPU by abstracting hardware. Eg – VMware, KVM, etc.

(2) Memory – abstract physical memory, allowing machines to share memory dynamically and distributed. Eg – ESXi, etc.

(3) I/O – abstract physical network interfaces, storage devices and other I/O devices. Eg – NSX, Open vSwitch (OVS), etc.

⇒ Approach to implement them –

(1) Access current resource usage
(2) Select virtualization tools (from above)
(3) Implement dynamic resource allocation
(4) monitor and scale resources.

⇒ Benefits of Virtualization –

(1) Increased utilization
(2) Reduce cost and scalability

Ans 4 — We should recommend Hybrid Cloud :

① High security — (a) Privat cloud for sensitive data, (b) Public cloud for less sensitive opercations

② Flexibility — (a) Dynamic workload, (b) Seamless integration

③ Cost efficiency — (a) Pay as you go model, (b) efficient resource allocation

④ Real world example : General Electric (GE)

⇒ Implementation steps :

① Access workload requirements
② Choose cloud providers (AWS, Azure, etc.)
③ Design cloud architecture
④ Set up cloud interconnectivity
⑤ Monitor and Optimize.

Ans 5 — ① Design Staal implementation —
↳ (a) cloud storage selection (Amazon S3)
(b) Storage class (S3 standard, Glacier).
(c) Integration with enterprise

② steps to migrate existing data to cloud —
↳ (a) Data assessment
(b) Choose data migration strategy (CLI)
(c) Data synchronization

③ Ensuring data security –

↳ (a) Encryption (SSE), (KMS)
(b) Access control (IAM)
(c) Data backup (CRR)