

- (d) What are the cost factors of EBS? What is "Dark Web"?
 $(2 + 2) + (1 + 1) + (2 + 1) + (2 + 1) = 12$

Group – E

8. (a) What is the significance of cloud-based storage? Explain in brief.
 (b) Mention the main advantages and disadvantages of the two types of storage devices -- Block and File – being used as cloud-based storage.
 (c) Through a tabular chart, compare / contrast the two types of cloud-based storage – Unmanaged and Managed – with respect to their key characteristics and typical usage in cloud computing.
 $2 + 6 + 4 = 12$
9. (a) Enlist any four cloud computing security risks recommended by Gartner.
 (b) Whether security can be realized through virtualization? Justify
 (c) Explain, with a tabular chart, how the security responsibilities are divided between the customer and the vendor for the four different deployment models of cloud.
 $4 + 3 + 5 = 12$

CLOUD COMPUTING (CSEN 4145)

Time Allotted : 3 hrs

Full Marks : 70

Figures out of the right margin indicate full marks.

Candidates are required to answer Group A and any 5 (five) from Group B to E, taking at least one from each group.

Candidates are required to give answer in their own words as far as practicable.

Group – A (Multiple Choice Type Questions)

1. Choose the correct alternative for the following: $10 \times 1 = 10$
- (i) Which of the following is essential concept related to Cloud Computing?
 (a) Reliability (b) Productivity
 (c) Abstraction (d) All of (a), (b) & (c).
- (ii) Most of the cloud backbones are built on this type of architecture
 (a) skeleton (b) linear
 (c) grid (d) template.
- (iii) Which one of these cloud-based solutions is not considered to be a PaaS offering?
 (a) Force.com (b) Amazon EC2
 (c) Microsoft Azure Services (d) All of these.
- (iv) Which of the following is fundamental unit of virtualized client in an IaaS deployment?
 (a) POD (b) Workstation
 (c) Workload (d) Resource Pool.
- (v) Which of the following cloud concept is related to pooling and sharing of resources?
 (a) Polymorphism (b) Abstraction
 (c) Virtualization (d) None of (a), (b) & (c).
- (vi) Which of the following runs on Xen Hypervisor?
 (a) Cloudera (b) AWS Autoscaling
 (c) AWS EC2 (d) Azure.

- (vii) Which of the following storage devices exposes its storage to clients as raw storage that can be partitioned to create volumes?
 (a) Block (b) File (c) RAM (d) Disk.
- (viii) Which category of cloud computing model does AWS fall under?
 (a) Infrastructure as a Service (b) Platform as a Service
 (c) Software as a Service (d) Compliance as a Service.
- (ix) Which one of these is not a cloud computing pricing model?
 (a) Free trial (b) Pay per use
 (c) Subscription (d) Perpetual.
- (x) Which one of the following is not really an advantage of cloud computing?
 (a) Worry-free about running out of storage
 (b) Handling diverse network types
 (c) Ubiquitous access to computing set-up
 (d) Paying only for what you use.

Group – B

2. (a) What is the main objective of Cloud CUBE model? What are the different dimensions of this model?
 (b) Describe Cloud Reference model with diagram.
 (c) What is the role of Cloud Carrier in NIST architecture?
 (d) Critically comment on: Elasticity and Scalability are mutually conflicting properties and cannot be achieved by a single solution.
 $(1 + 2) + 4 + 2 + 3 = 12$
3. (a) What do you mean by “Rapid Provisioning” and “Pay per Use” in connection with “Cloud Computing” definition?
 (b) What do you mean by Hybrid Cloud? Describe how Scope of control varies across the service models for Provider and Consumer.
 (c) Why SLA is important? How the performance of carrier may affect the reputation of a Provider? How is it protected?
 $(2 + 2) + (1 + 3) + (2 + 1 + 1) = 12$

Group – C

4. (a) What do you mean by Availability and Reliability in IaaS? How these are maintained by IaaS provider for different IaaS resources?
 (b) What are the main working components of PaaS middleware? Describe two essential characteristics of PaaS as per your opinion.

- (c) What is SoA?
 (d) Critically Comment on: SOAP and REST are equally capable.
 $(2 + 3) + (2 + 2) + 1 + 2 = 12$
5. (a) A company ABZ decides to provide free access to cloud resources dedicated to higher education. Which one of the three cloud computing delivery models, SaaS, PaaS, or IaaS should it embrace and why? Which deployment model they should use and why? Will this solution have an impact on distance learning? Why?
 (b) What do you mean by “Vendor Lock-in”? Which service model is mostly affected by it and why?
 (c) What is IaaS? Give example of a real world application of IaaS.
 $(1 + 2 + 1 + 1 + 2) + (1 + 1 + 1) + (1 + 1) = 12$

Group – D

6. (a) What is virtualization? Depict, using a classification chart, the taxonomy of various virtualization techniques.
 (b) Compare the two types of virtualization for execution environments – Process-level and System-level – with respect to technique and virtualization model.
 (c) Explain through suitable schematic diagram(s) and some necessary explanation(s) the following:
 (i) Type-I (or Native) Hypervisor, and
 (ii) Type-II (or Hosted) Hypervisor.
 $4 + 4 + 4 = 12$
7. (a) An organization debating whether to install a private cloud or to use a public cloud, e.g., the AWS, for its computational and storage needs, asks your advice. How will you use each one of the following items and come up with a solution:
 (i) the description of the algorithms and the type of the applications to run
 (ii) the system software used by these applications
 (iii) the resources needed by each application
 (iv) the size of the user population
 (v) the relative experience of the user population
 (vi) the costs involved.
 (b) What is AMI? Where are these stored?
 (c) What are different types of EC2 instances exist according to financial model? Which type of instance is the costliest?