

**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 × 1 = 10**
- (i) The _____ model originally did not require a cloud to use virtualization to pool resources.
(a) Paas (b) Broker (c) NIST (d) XaaS.
- (ii) Which one is not a Google API?
(a) Ads and AdSense (b) AJAX
(c) Google Gears (d) Geo.
- (iii) Which of the following models is the highest degree of integration in cloud computing?
(a) PaaS (b) NaaS (c) SaaS (d) DbaaS.
- (iv) Cloud services mainly communicate using
(a) XML (b) CHAP (c) REST (d) SOAP.
- (v) Spot the odd one out
(a) Google GAE (b) IBM Deep Blue
(c) Amazon AWS (d) Microsoft Azure.
- (vi) Which of the following visualization is most commonly achieved through a mapping mechanism where a logical storage address is translated into a physical storage address?
(a) Storage (b) OS (c) Software (d) Network.
- (vii) Which of the following cloud concept is related to pooling and sharing of resources?
(a) Polymorphism (b) Abstraction
(c) Virtualization (d) Elasticity.
- (viii) _____ allows a subscriber to increase or decrease its computing requirements as needed
(a) Rapid elasticity (b) On-demand self service
(c) Broad network access (d) Resource pooling.

- (ix) For the _____ model, the security boundary may be defined for the vendor to include the software framework and middleware layer.
(a) SaaS (b) PaaS (c) IaaS (d) CaaS.
- (x) Which of the following flag is used by backup software to specify whether a file should be backed up or not?
(a) archive bit (b) active bit
(c) passive bit (d) backup bit.

Group – B

2. (a) What do you mean by off premise cloud deployment? Explain with a real-world example.
- (b) Critically comment on the following statements:
(i) SLA can be formed in between every pair of actors in NIST reference architecture.
(ii) Reliability and Maintainability are important QoS parameters for IaaS model.
- (c) What are the main advantages of having Cloud Cube model? What are the different dimensions of this model?
- (2 + 2) + (2 + 2) + (2 + 2) = 12**

3. (a) How different actors in NIST cloud model interact? Explain with a diagram.
- (b) Describe the Cloud Cube Model along with an illustration.
- (c) In cloud reference model, how is Integration and middleware layer realised?
- (d) Discuss the considerations about Scalability and Elasticity while deploying any Cloud Model.
- (1 + 2) + 3 + 3 + 3 = 12**

Group – C

4. (a) Critically comment on the statement: IaaS is always included in SaaS offering.
- (b) What is PoD? How are Amazon Machine Images (AMI) constructed? What are the components of PaaS core middleware?
- (c) Describe the process of User Centric Identity Verification with a diagram.
- 2 + (1 + 2 + 3) + 4 = 12**
5. (a) What is Vendor lock in? How does it affect cloud computing? Give one real life example.
- (b) Define Multi-tenancy with respect to PaaS.
- (c) How is SOAP useful in SOA?
- (d) Suppose a company A decides to set up a cloud to deliver Software as a Service to its clients through a remote location. Answer the following:
(i) What are the security risks for which a customer needs to be careful about?
(ii) What kind of infrastructural set up will be required to set up a cloud?

(iii) What sort of billing model will such customers have?

$$(1 + 2 + 1) + 2 + 2 + (2 + 1 + 1) = 12$$

Group - D

6. (a) Critically comment on the following statements:
(i) Abstraction and Virtualization are the same concept.
(ii) Virtualization can only be applied for creating machine instances.
- (b) What is Hypervisor? Explain different types of Hypervisors with suitable examples.
- (c) Your company is mostly run by part-time programmers who wish to work on Saturdays and Sundays. What kind of EC2 instances are suitable to subscribe for your company? Which is the cheapest computing service option here?
 $(2 + 2) + 3 + (3 + 2) = 12$
7. (a) What are the different IaaS offerings by VMware? How does it work?
- (b) What is the difference between NoSQL and RDBMS? Mention the advantages of NoSQL. Depending on what factors or parameters would you choose to implement a database using NoSQL?
- (c) There are 1000 patients in an online healthcare portal. You have to store the 1000 patient's data into a cloud repository. Fill up the data field(s) for each role as you can define for the portal. On this data, a futuristic medical research will be conducted later. Explain what kind of cloud products will you use for this purpose.
 $(2 + 2) + (3 \times 1) + (3 + 2) = 12$

Group - E

8. (a) Explain the Reduce() phase with a clear illustration.
- (b) With the help of suitable practical examples explain how multiple readers and multiple writers are handled in cloud-based file systems.
- (c) Identify some services for an online banking system. What kind of privacy and security do you want to provide for identified 'data' fields relevant to this domain?
 $4 + 4 + (2 + 2) = 12$
9. (a) How is availability and replication related in distributed storage systems?
- (b) What are the different types of internal security breaches that may occur in a Cloud environment? Mention the steps to mitigate such breaches.
- (c) What are the various identity and access management (IAM) practices followed for authentication, authorization, and auditing of the users accessing cloud services?
- (d) How is Privacy preserved in cloud despite having various third party intrusions?
 $3 + (2 + 2) + 3 + 2 = 12$

Department & Section	Submission link:
CSE A and B1	https://classroom.google.com/c/MTIyOTAxMzYzODgw/a/Mjc0NzEzODg4OTgx/details...
CSE C and B2	https://classroom.google.com/c/MTIyOTAxMzYzODg5/a/Mjc0NzExODY3Mjk4/details