

INTRODUCTION TO CLOUD COMPUTING (CSE3222)

Time Allotted : 2½ hrs

Full Marks : 60

Figures out of the right margin indicate full marks.

*Candidates are required to answer Group A and
any 4 (four) from Group B to E, taking one from each group.*

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

Group – A

1. Answer any twelve:

12 × 1 = 12

Choose the correct alternative for the following

- (i) Which deployment model of Cloud computing should be used by a business group consisting of multiple companies for its authorized users?
(a) Community Cloud (b) Hybrid Cloud
(c) Public Cloud (d) Private Cloud
- (ii) How many types of private deployment is possible in Cloud?
(a) One (b) Two
(c) Four (d) Six
- (iii) “Customers can use cloud computing as required without human contact between consumers and service providers” comes under the feature
(a) On-demand self service (b) Broad network access
(c) Resource pooling with multi-tenancy (d) Elasticity
- (iv) In Xen which one of these virtualization techniques is used?
(a) Full virtualization (b) Process virtualization
(c) Para virtualization (d) Partial virtualization
- (v) Who should have the primary responsibility of managing the database for a SaaS-based cloud computing environment like Salesforce.com?
(a) Service Provider (b) Service Consumer
(c) Both of them (d) None of them
- (vi) Which Ring is considered as the least privileged mode?
(a) Ring -1 (b) Ring 0 (c) Ring 2 (d) Ring 3
- (vii) A developer wants to use Amazon EBS for their application. What action should he/she take?
(a) Replicate the EBS volume in a different Availability zone
(b) Attach the EBS volume to multiple EC2 instances in multiple Availability zones
(c) Back up the Amazon EBS volume using snapshots
(d) Attach the EBS volume to an EC2 instance

- (viii) Which AWS service can be used to distribute content globally and improve website performance?
 (a) Amazon CloudFront (b) AWS Glacier
 (c) AWS Snowball (d) Amazon Route 53
- (ix) Fully Managed –AWS CodeCommit eliminates the need to
 (a) host your own source control servers.
 (b) maintain your own source control servers.
 (c) backup your own source control servers.
 (d) all of the above
- (x) Which option is a user's responsibility when running Amazon RDS?
 (a) Operating system patching (b) Operating system installation
 (c) Application optimization (d) Database software patching

Fill in the blanks with the correct word

- (xi) _____ is an intermediary that provides connectivity and transport of Cloud services from Cloud providers to Cloud consumers.
- (xii) A key pair consists of a public key that _____ stores and a private key file that _____ stores.
- (xiii) Amazon S3 Glacier is designed to provide _____ 9s of durability for objects.
- (xiv) _____ scaling uses Amazon EC2 Auto Scaling, CloudWatch, and Elastic Load Balancing.
- (xv) _____ means the infrastructure has a built in component redundancy.

Group - B

2. (a) What is meant by Vendor Lock-In? Which service model is most affected by it? [[CO1](Analyse/HOCQ)]
 (b) What are the five main features or attributes of Cloud Computing according to the NIST model? [[CO1](Understand/LOCQ)]
 (c) Explain service orchestration in Cloud Computing. [[CO1](Remember/LOCQ)]
(2 + 1) + 5 + 4 = 12
3. (a) Explain "Multi-tenancy" and "Rapid provisioning" in Cloud Computing. [[CO1](Understand/LOCQ)]
 (b) What do the internal and external dimensions of the Cloud Cube model signify? [[CO1](Remember/LOCQ)]
 (c) What is a middleware layer? In the Cloud, who uses the middleware layer? Who installs or manages the middleware layer in the Cloud? [[CO1](Understand/IOCQ)]
(2 + 2) + 3 + (1 + 2 + 2) = 12

Group - C

4. (a) What is server consolidation? [[CO2](Remember/LOCQ)]

- (b) Distinguish between Type I and Type II hypervisors with a suitable schematic diagram and necessary explanation. [[C02](Analyse/IOCQ)]
- (c) What do you mean by privileged and nonprivileged instructions? [[C02](Understand/LOCQ)]
- 2 + (3 + 3) + 4 = 12**
5. (a) What are the security rings and privilege modes of instruction execution? Give a suitable schematic diagram with necessary explanation. [[C02](Analyse/IOCQ)]
- (b) Explain the components “guest”, “host”, and “virtualization layer” in a virtualized environment. [[C02](Remember/LOCQ)]
- (c) Write short notes on the following:
 (i) Hardware assisted Virtualization
 (ii) Operating System level Virtualization. [[C02](Understand/LOCQ)]
- 3 + 3 + (3 + 3) = 12**

Group - D

6. (a) What are the four pillars of cost optimization of Amazon EC2? [[C04](Analyse/LOCQ)]
- (b) What is Serverless computing? _____ is a serverless compute service that provides _____. [[C04](Analyse/LOCQ)]
- (c) What are the four benefits of Elastic Beanstalk? [[C04](Analyse/IOCQ)]
- 4 + (2 + 0.5 + 1.5) + 4 = 12**
7. (a) How do security groups work? What is a Network Access Control List? [[C04](Analyse/LOCQ)]
- (b) Write any three ways Amazon Route 53 enables you to improve the availability of your applications that run on AWS. [[C04](Analyse/LOCQ)]
- (c) Write four Amazon CloudFront benefits. [[C04](Analyse/IOCQ)]
- (3 + 2) + 3 + 4 = 12**

Group - E

8. (a) What is meant by a database instance? Is it different from any other EC2 instance? [[C04](Understand/LOCQ)]
- (b) “Amazon RDS provides high availability”- critically comment on this statement with proper justification. [[C05](Analyse/IOCQ)]
- (c) What are the two different kinds of primary key that DynamoDB support? Explain each one of them. [[C04](Remember/LOCQ)]
- (3 + 1) + 4 + 4 = 12**
9. (a) Elastic Load Balancing distributes incoming application or network traffic _____. [[C05](Gain insight and understand/LOCQ)]
- (b) How is Amazon CloudWatch used? Mention the four uses. [[C06](Apply/LOCQ)]
- (c) Write if the following CloudWatch alarms are correct. If incorrect, then please rectify it.
 (i) If average CPU utilization is > 60% for 5 minutes
 (ii) If the number of simultaneous connections is > 10 for 1 minute
 (iii) If the maximum bucket size in bytes is around 3 for 1 day

- (iv) If the number of healthy hosts is < 5 for 10 minutes
(v) If the volume of read operations is $> 1,000$ for 10 seconds.

[[CO6)(Apply/IOCQ)]

2 + 4 + 6 = 12

Cognition Level	LOCQ	IOCQ	HOCQ
Percentage distribution	55.21	41.67	3.12