

CLOUD COMPUTING WITH AWS (CSEN 3222)

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) Elasticity means
 - (a) Pooling the computing resources to provide services to multiple customers.
 - (b) Allowing customers to use cloud computing as required without human contact between consumers and service providers.
 - (c) Accessing the data of the cloud or upload the data to the cloud from anywhere just with the help of a device and an internet connection.
 - (d) From the standpoint of the client, cloud computing resources should look limitless and can be purchased at any time and in any quantity.
- (ii) 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
- (iii) Which ring is used by the user applications?
 - (a) Ring 0
 - (b) Ring -1
 - (c) Ring 2
 - (d) Ring 3
- (iv) Para virtualization is also known as
 - (a) CPU-assisted virtualization
 - (b) Memory-assisted virtualization
 - (c) OS-assisted virtualization
 - (d) None of the above
- (v) For the CIDR address 192.0.2.0/24, how many IP addresses are available?
 - (a) 2^{24}
 - (b) 2^8
 - (c) 2^{16}
 - (d) 2^4
- (vi) When an EC2 instance is stopped and then started again
 - (a) The *public* IPv4 address and *external* DNS hostname will change
 - (b) The *private* IPv4 address and *internal* DNS hostname will change
 - (c) The *public* IPv4 address and *internal* DNS hostname will change
 - (d) The *private* IPv4 address and *external* DNS hostname will change.

- (vii) A company wants to store data that is not frequently accessed. What is the best and cost-effective solution that should be considered?
- (a) AWS Storage Gateway
 - (b) Amazon Simple Storage Service Glacier
 - (c) Amazon Elastic Block Store (Amazon EBS)
 - (d) Amazon Simple Storage Service (Amazon S3)
- (viii) What AWS service can be used to monitor and gain insights into application performance?
- (a) AWS CloudTrail
 - (b) AWS Config
 - (c) AWS CloudWatch
 - (d) AWS Trusted Advisor
- (ix) Which of the following is a fully-managed NoSQL database service?
- (a) Amazon Relational Database Service (Amazon RDS)
 - (b) Amazon DynamoDB
 - (c) Amazon Aurora
 - (d) Amazon Redshift.
- (x) A SysOps engineer working at a company wants to protect their data in transit and at rest. What services could they use to protect their data?
- (a) Elastic Load Balancing
 - (b) Amazon Elastic Block Storage (Amazon EBS)
 - (c) Amazon Simple Storage Service (Amazon S3)
 - (d) All of the above.

Fill in the blanks with the correct word

- (xi) A hypervisor recreates a hardware environment in which _____ operating systems are installed.
- (xii) In the VMware full virtualization model, the hypervisor is in Ring _____.
- (xiii) _____ instructions alter the state of the CPU registers.
- (xiv) Amazon S3 buckets are _____ containers for objects.
- (xv) _____ enables you to set alarms to automatically send notifications to SNS topics.

Group - B

2. (a) Explain “Pay as you go” and “Measured service” in Cloud computing. [[CO1](Understand/LOCQ)]
- (b) What is the Cloud Cube model? Mention the four dimensions of the Cloud Cube model. [[CO1](Understand/LOCQ)]
- (c) Critically comment on the terms “Elasticity” and “Scalability” with respect to Cloud Computing. [[CO1](Analyse/HOCQ)]
- (1 + 1) + (2 + 4) + (2 + 2) = 12**
3. (a) Consider the following scenario:
An educational and research organization is interested to install Cloud. The stakeholders are professors, research fellows, and students. Professors share

study materials and take online exams. Research fellows execute complex algorithms. Students discuss doubts in forums.

Answer the following questions:

- (i) Which deployment model is suitable? [[C01](Apply/HOCQ)]
 - (ii) Why have you chosen this deployment model? Explain with proper justification. [[C01](Understand/LOCQ)]
 - (b) Differentiate between the horizontal scaling and the vertical scaling policies. [[C01](Remember/LOCQ)]
 - (c) Define the five actors in the NIST Reference model. [[C01](Remember/LOCQ)]
- (1 + 3) + (1.5 + 1.5) + 5 = 12**

Group - C

- 4. (a) What do you mean by Virtualization in Cloud Computing? [[C02](Remember/LOCQ)]
 - (b) "Virtualization has a number of advantages, but it also has downsides"--- Justify this statement. [[C02](Analyse/IOCQ)]
 - (c) Explain Full Virtualization. Mention one advantage and one disadvantage of this technique. [[C02](Understand/LOCQ)]
 - (d) Consider a scenario where a Cloud service provider creates a new service offering which allows the cloud users to deploy virtual machines and specify their network configurations. What cloud service model is this? Why? [[C01](Apply/HOCQ)]
- 2 + 3 + (3 + 1 + 1) + 2 = 12**
- 5. (a) Discuss the VMware full virtualization architecture. Draw the schematic diagram and give the necessary explanation. [[C02](Analyse/IOCQ)]
 - (b) "In AWS, you pay less when you use more"--- Justify. [[C03](Analyse/IOCQ)]
 - (c) Write short notes on the following:
 - (i) SaaS service model
 - (ii) IDaaS. [[C01](Remember/LOCQ)]
- 4 + 2 + (3 + 3) = 12**

Group - D

- 6. (a) Please define Regions, Availability Zones, and Edge Locations. [[C02](Remember/LOCQ)]
 - (b) What does AWS Identity and Access Management (IAM) enable you to do? [[C03](Analyse/IOCQ)]
 - (c) Which component of AWS global infrastructure does Amazon CloudFront use to ensure low-latency delivery? [[C03](Analyse/IOCQ)]
 - (d) Which of the following services are global instead of Regional? Amazon EC2, IAM, Lambda, and Route 53. [[C03](Analyse/LOCQ)]
 - (e) Under which service category does the Amazon VPC service appear? [[C03](Analyse/IOCQ)]
- (3 × 2) + 2 + 1 + 2 + 1 = 12**
- 7. (a) What is Amazon Machine Image? Write any five key decisions to make when you create an EC2 instance by using the AWS Management Console Launch Instance Wizard. [[C04](Analyse/LOCQ)]

- (b) How to use Amazon CloudWatch in connection with Amazon EC2? [[C04](Analyze/IOCQ)]
- (c) Between Amazon EC2 or Amazon RDS, which provides a managed service? What does managed service mean? [[C04](Analyze/LOCQ)]
- (3 + 5) + 2 + 2 = 12**

Group - E

8. (a) What are the functionalities of Amazon RDS read replicas? Write four cases of when not to use Amazon RDS? [[C04](Analyze/IOCQ)]
- (b) What do you pay for when you use On-Demand Instances of RDS? What is the case for reserved instances? [[C04](Analyze/IOCQ)]
- (4 + 4) + (2 + 2) = 12**
9. (a) Why is auto-scaling important? What is auto-scaling group? [[C05](Gain insight and understand/LOCQ)]
- (b) Which service would you use to send alerts based on Amazon CloudWatch alarms? [[C06](Apply/LOCQ)]
- (c) What is the difference between scaling up and scaling out? [[C06](Apply/IOCQ)]
- (d) Amazon CloudWatch, Amazon EC2 Auto Scaling, and Elastic Load Balancing work well individually. Can you explain the statement with a proper example? [[C06](Apply/IOCQ)]
- (3 + 3) + 1 + 2 + 3 = 12**

Cognition Level	LOCQ	IOCQ	HOCQ
Percentage distribution	56.3	33.3	10.4