

CLOUD COMPUTING
(CSEN 5243)

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) Azure Storage plays the same role in Azure that _____ plays in Amazon Web Services.
(a) RDS
(b) EC2
(c) S3
(d) MapReduce
- (ii) _____ is a complete operating environment with applications, management, and user interface.
(a) IaaS
(b) SaaS
(c) PaaS
(d) CaaS
- (iii) Which of the following are the features of Cloud computing?
(a) Security
(b) Availability
(c) Broad Network Access
(d) All of these
- (iv) Which of the following is used to define the service component that performs the service?
(a) WSDL
(b) SCDL
(c) XML
(d) HTML
- (v) Which of the following architectural standards is working with the Cloud computing industry?
(a) Web application frameworks
(b) Service oriented architecture
(c) Standardized Web services
(d) All of the above

- (vi) Which of the following standard is the key to creating Single Sign-On (SSO) systems?
 - (a) OpenID 2.0
 - (b) CHAP
 - (c) SMAL
 - (d) SOAP
- (vii) _____ means several customers of a Cloud vendor are using the same computing resources.
 - (a) Virtualization
 - (b) Multi-tenancy
 - (c) Load Balancing
 - (d) Identity and Access management
- (viii) Which of the following runs on Xen Hypervisor?
 - (a) AWS EC2
 - (b) VMWare
 - (c) Azure
 - (d) Hyper-V
- (ix) Which of the Amazon products supports indexing and data queries to both EC2 and S3?
 - (a) CloudWatch
 - (b) Amazon Cloudfront
 - (c) Autoscaling
 - (d) SimpleDB
- (x) Which of the following is an edge-storage or content-delivery system that caches data in different physical locations?
 - (a) Amazon Relational Database Service
 - (b) Amazon SimpleDB
 - (c) Amazon Cloudfront
 - (d) Amazon Associates Web Services

Fill in the blanks with the correct word

- (xi) _____ authentication requires the outside use of a network security or trust service.
- (xii) _____ deployment model of Cloud computing is suitable for a single organization and its authorized users.
- (xiii) For the _____ model, the security boundary may be defined for the vendor to include the software framework and middleware layer..
- (xiv) The technology used to distribute service requests to resources is referred to as _____.
- (xv) Ads and AdSense are API from the organization named _____.

Group - B

2. (a) Discuss the Cloud Service Models- Infrastructure as a Service (IaaS), Platform as a Service (PaaS), and Software as a Service (SaaS). Clearly mention the differences between these 3 models. *[[CO1](Remember/LOCQ)]*
- (b) Explain Execution Environment Virtualization with a diagram. Why the Interpreter Routines are there in VMM? Why XEN is considered to implement para-virtualization? *[[CO1](Understand/LOCQ)]*
- 6 + (3 + 1 + 2) = 12**
3. (a) What do you mean by “Dynamic Provisioning” and “SLA Negotiation” in connection with Cloud Computing definition? Describe with real world scenario. *[[CO2,CO5](Explain/IOCQ)]*
- (b) Explain the Cloud Cube Model. *[[CO1](Remember/LOCQ)]*
- (c) What are the different deployment models in Cloud? Explain. *[[CO1](Remember/LOCQ)]*
- (2 + 2 + 1 + 1) + 3 + 3 = 12**

Group - C

4. (a) Explain multi-tenancy with respect to IaaS and SaaS. *[[CO3](Understand/LOCQ)]*
- (b) Explain some solutions where
- (i) Use of IaaS is suitable
- (ii) Use of IaaS is not suitable. *[[CO5](Apply/HOCQ)]*
- (c) How Availability and Reliability can be achieved in IaaS? What is Server consolidation? How is it achieved? *[[CO1](Understand/LOCQ)]*
- 4 + 4 + (2 + 1 + 1) = 12**
5. (a) What is meant by “Vendor Lock In”? Which service model is most affected by it? Explain with reason. *[[CO1,CO3](Analyse/HOCQ)]*
- (b) What do you mean by IDaaS interoperability? *[[CO2](Understand/LOCQ)]*
- (c) Company ABC is incepted as a SaaS solution provider. They are currently dedicated to providing the solution to a Bank account management system. For the scenario answer the following: Which of the Private or Public Cloud is recommended in this scenario? Or it has to be something else? Why? What are the effective set of QoS parameters to be mentioned in SLA? *[[CO6](Analyse/HOCQ)]*
- 4 + 2 + 6 = 12**

Group - D

6. (a) Explain, with the help of schematic diagram(s), how chunks are handled during reading/write operations involving Client, Master, and Chunk-server in a GFS environment. *[[CO4](Remember/LOCQ)]*
- (b) Justify the statement: “Infrastructure Security management of the Hybrid model and Public model imposes responsibilities on Customer only.” *[[CO2](Apply /IOCQ)]*
- (c) Critically comment and Justify: Service Security for private deployment is entirely on Consumer. *[[CO1](Understand/LOCQ)]*

- (d) Explain the Retirement phase of Service Lifecycle. [[CO2](Remember/LOCQ)]
4 + 2 + 2 + 4 = 12
7. (a) What is content Syndication? How is it related to webmail? How are the user interfaces in webmail developed currently? [[CO2](Remember/LOCQ)]
- (b) What is the role of a Cloud broker in Access Management? What is OAuth? How does it work? What is Privacy? [[CO2](Remember/LOCQ)]
- (c) What kind of Meta data is stored in the Master node for GFS? [[CO4](Understand/IOCQ)]
(1 + 1 + 1) + (2 + 1 + 2 + 1) + 3 = 12

Group - E

8. (a) Which products from Amazon/Google/Microsoft are relevant with the following scenario and why:
- (i) A serverless deployment is necessary for a client application
- (ii) A consumer wants to monitor the performances for the subscribed services over various Calendar months.
- (iii) A consumer wants to display choice-based advertisements as a banner.
- (iv) A content delivery network to be established world-wide. [[CO3](Apply/IOCQ)]
- (b) What do you mean by Cloud Federation? Discuss the benefits of Cloud Federation. [[CO3](Understand/IOCQ)]
(4 × 2) + 4 = 12
9. (a) Generally, on what factors does the cost of AMI depend? Also, mention the additional factors other than the general factors. [[CO2,CO3](Analyze/IOCQ)]
- (b) State whether the following are TRUE/FALSE with explanation:
- (i) S3 can be attached at any time only to a single instance.
- (ii) EBS volumes can contain any file system.
- (iii) The Google Compute Engine implements the API of Amazon EC2. [[CO3](Analyze/HOCQ)]
- (c) What is Elastic IP? What is its use? [[CO2](Analyze/LOCQ)]
(2 + 2) + 6 + 2 = 12

Cognition Level	LOCQ	IOCQ	HOCQ
Percentage distribution	51.04	28.13	20.83

Course Outcome (CO):

After the completion of the course students will be able to

1. Identify the architecture and infrastructure of cloud computing, including SaaS, PaaS, IaaS, public cloud, private cloud, hybrid cloud.
2. Describe the core issues of cloud computing such as security, privacy, and interoperability to choose the appropriate technologies, algorithms, and approaches for the identified problems.
3. Analyze various cloud computing solutions.
4. Evaluate cloud Storage systems and Cloud security, the risks involved, its impact.
5. Apply knowledge for solving real life cloud computing problem scenario and illustrate solutions.
6. Develop appropriate cloud computing solutions and recommendations according to the applications used.

*LOCQ: Lower Order Cognitive Question; IOCQ: Intermediate Order Cognitive Question; HOCQ: Higher Order Cognitive Question.