

CLOUD COMPUTING
(INFO 4242)

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 is the most essential concept related to Cloud computing?
(a) Abstraction (b) Reliability
(c) Productivity (d) All of the mentioned.
- (ii) Which of the following is the correct statement about cloud computing?
(a) Cloud computing abstracts systems by pooling and sharing resources
(b) Cloud computing is nothing more than the Internet
(c) The use of the word “cloud” makes reference to the two essential concepts
(d) All of the mentioned.
- (iii) Which of the following cloud concept is related to pooling and sharing of resources?
(a) Polymorphism (b) Abstraction
(c) Virtualization (d) None of the mentioned.
- (iv) Which of the following lets a Web service advertise itself in terms of a collection of endpoints?
(a) WSDL (b) VMC (c) SOAP (d) All of the mentioned.
- (v) Point out the wrong statement.
(a) Cloud computing arises from services available over the Internet communicating
(b) XML-RPC uses platform-independent XML data to encode program calls that are transported over HTTP
(c) SOAP uses JSON for its messages and uses RPC and HTTP for message passing
(d) None of the mentioned.
- (vi) Which of the following provide system resource access to virtual machines?
(a) VMM (b) VMC (c) VNM (d) All of the mentioned.
- (vii) Which of the following architectural standards is working with cloud computing industry?
(a) Web-application frameworks (b) Service-oriented architecture
(c) Standardized Web services (d) All of the mentioned.

- (viii) Which of the following is the correct statement?
 (a) Cloud computing presents new opportunities to users and developers
 (b) Service Level Agreements (SLAs) is small aspect of cloud computing
 (c) Cloud computing does not have impact on software licensing
 (d) All of the mentioned.
- (ix) Which of the following is the Cloud Platform provided by Amazon?
 (a) AWS (b) Cloudera (c) Azure (d) All of the mentioned.
- (x) Which of the following is the most refined and restrictive cloud service model?
 (a) PaaS (b) IaaS (c) SaaS (d) CaaS.

Fill in the blanks with the correct word

- (xi) Applications and services that run on a distributed network using virtualized resources is known as _____.
- (xii) Cloud computing is an abstraction based on the notion of pooling physical resources and presenting them as a _____ resource.
- (xiii) _____ as a Service is a cloud computing infrastructure that creates a development environment upon which applications may be build.
- (xiv) SaaS supports multiple users and provides a shared data model through _____ model.
- (xv) A service that concentrates on hardware follows the _____ as a Service model.

Group - B

2. (a) Explain three actors briefly as per NIST cloud computing reference architecture. [[C01](C02)(Understand/LOCQ)]
 (b) Compare between service aggregation and service arbitrage. [[C01](Analyse/IOCQ)]
 (c) Compare between cluster, grid and cloud computing with respect to different criteria. [[C01](Analyse/IOCQ)]
(3 × 2) + 2 + 4 = 12
3. (a) Explain in brief the differences between public cloud, private cloud, hybrid cloud and community cloud with respect to different parameters. [[C01](C02)(C03)(Analyse/IOCQ)]
 (b) Explain IaaS and PaaS. [[C02](Understand/LOCQ)]
 (c) Explain briefly the distributed computing system based workstation-server model. [[C01](Understand/LOCQ)]
6 + 3 + 3 = 12

Group - C

4. (a) Explain different benefits of virtualization. Compare between full-virtualization, para-virtualization and OS-level virtualization. [[C04](C03)(Understand/LOCQ)(Apply/IOCQ)]
 (b) Explain three importances of storage virtualization. [[C04](Understand/LOCQ)]

- (c) Compare between type1 and type2 hypervisor. [[C04](Apply/IOCQ)]
(2 + 4) + 3 + 3 = 12
5. (a) Explain open flow protocol with an example. [[C04](Understand/LOCQ)]
 (b) Explain Network Function Virtualization (NFV) briefly. [[C04](Understand/LOCQ)]
 (c) Briefly explain the architecture of Web services. Also explain atleast two benefits of using web services. [[C06](Understand/LOCQ)]
4 + 4 + (2 + 2) = 12

Group - D

6. (a) Explain different network level and host level security threats with preventive method. [[C03](Understand/LOCQ)]
 (b) Explain different SLA parameters and metrics. [[C03](Understand/LOCQ)]
 (c) What are the advantages of SLA as per 'Sun Microsystems Internet Data Center Group's' report? [[C03](Understand/LOCQ)]
(3 + 3) + 3 + 3 = 12
7. (a) Explain different advantages of ITIL. [[C03](Understand/LOCQ)]
 (b) Explain different key processes and activities of service strategy phase of ITIL. [[C03](Understand/LOCQ)]
 (c) Briefly discuss any three authentication techniques in cloud computing [[C03](Understand/LOCQ)]
 (d) Explain attribute based access control and task based access control. [[C03](Understand/LOCQ)]
3 + 3 + 3 + 3 = 12

Group - E

8. (a) Compare storage services of Amazon with Microsoft cloud service. [[C05](Apply/IOCQ)]
 (b) Explain different features of cloud SQL for postgresQL of Google cloud service. [[C05](Understand/LOCQ)]
 (c) Explain different key features of App services of Microsoft cloud service. [[C05](Understand/LOCQ)]
4 + 4 + 4 = 12
9. (a) Compare Database services of Amazon with Google cloud service. [[C05](Apply/IOCQ)]
 (b) Compare different pricing strategies of Amazon VPC and Amazon VPC. [[C05](Understand/LOCQ)]
 (c) Explain different components of chargeback methods. [[C05](Understand/LOCQ)]
4 + 4 + 4 = 12

Cognition Level	LOCQ	IOCQ	HOCQ
Percentage distribution	69.79	30.21	0

Course Outcome (CO):

After the completion of the course students will be able to

1. Articulate the main concepts, key technologies, strengths, and limitations of cloud computing
2. Identify the architecture and infrastructure of cloud computing, including SaaS, PaaS, IaaS, public cloud, private cloud, hybrid cloud, etc.
3. Explain the core issues of cloud computing such as security, privacy, and interoperability.
4. Discuss system, network and storage virtualization and outline their role in enabling the cloud computing system model.
5. Explain Amazon, Google, Microsoft cloud services.
6. Understand different web services techniques to provide SaaS.

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