NPTEL Online Certification Courses

Indian Institute of Technology Kharagpur

Cloud Computing

Assignment- Week 1

TYPE OF QUESTION: MCQ/MSQ

Number of questions: **10** **Total mark: 10 X 1 = 10**

QUESTION 1:

Utility computing encapsulates the following characteristic(s)

a) Mobility amalgamation
b) No impact on resource utilization
c) Pay-per-use pricing business model
d) None of above

Correct Answer: c
Detailed Solution: Utility computing is a pay-per-use pricing business model.

QUESTION 2:

In the context of the client-server architecture: Statement (i) posits that virtualization is a fundamental principle; Statement (ii) claims that the system has limited scalability.

a) Only Statement (i) is correct
b) Only Statement (ii) is correct
c) Both Statements (i) and (ii) are correct
d) None of the statements is correct

Correct Answer: b
Detailed Solution: Detailed Solution: In the case of the client-server model: there is no concept of virtualization; the system can scale up to a certain extent

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QUESTION 3:

A cluster is a type of _____ or distributed computing platform consisting of a collection of interconnected stand-alone computing computers working together in a _____computing resource.

a) computers, parallel
b) single integrated, parallel
c) node, parallel
d) parallel, single integrated

Correct Answer: d
Detailed Solution: A cluster is a type of parallel or distributed computing platform consisting of a collection of interconnected stand-alone computing computers working together in a single integrated computing resource.

QUESTION 4:

Dropbox is an example of:

a) Software as a Service or SaaS
b) Platform as a Service or PaaS
c) Function as a Service or FaaS
d) Infrastructure as a Service or IaaS

Correct Answer: a
Detailed Solution: Dropbox is categorized as Software as a Service (SaaS) due to the nature of the services it offers and how it delivers these services to its users.

QUESTION 5:

For less data-intensive applications, horizontal scale-out elasticity is the ideal solution.

a) True
b) False

Correct Answer: b
Detailed Solution: Horizontal scale-out means adding additional computation units and having them act in concert. It is suitable for large scale-out scenarios.

QUESTION 6:

The combination of Service-Oriented Infrastructure and Cloud Computing leads to _____.

a) PaaS
b) FaaS
c) Serverless
d) XaaS

Correct Answer: d

Detailed Solution: "Anything as a Service" is what XaaS stands for. It's a catch-all term for cloud-based services.

QUESTION 7:

Utility computing is a service-provisioning model, in which a service provider makes computing resources and infrastructure management available to the customer.

a) True
b) False

Correct Answer: a

Detailed Solution: Utility computing is a service-provisioning model, in which a service provider makes computing resources and infrastructure management available to the customer.

QUESTION 8:

Which of the following is false?

a) Private cloud is dedicated solely to an organization.
b) Community cloud is a composition of public and private cloud.
c) Public cloud is available to the general public.
d) None of these

Correct Answer: b

Detailed Solution: Community cloud is shared by several organizations and serves a specific goal.

QUESTION 9:

Which of the following is one of the characteristics of PaaS?

a) Provides tools to deploy user applications
b) Application is provided by the cloud provider
c) Resources are distributed as a service
d) None of these

Correct Answer: a
Detailed Solution: PaaS provides tools to deploy user applications.

QUESTION 10:

Which of the following is/are a type of Grid?

a) Computational Grid
b) Data Grid
c) Edge Grid
d) All of the above

Correct Answer: a, b
Detailed Solution: Types of grid are data grid, computational grid and collaboration grid.

Cloud Computing

Assignment- Week 2

TYPE OF QUESTION: MCQ/MSQ

Number of questions: **10** **Total mark: 10 X 1 = 10**

QUESTION 1:

_____ generally stores the cloud subscriber's metadata like user credentials and OS images.

a) SLA (Service Level Agreement)
b) Cloud Manager
c) DOS (Data Object storage)
d) MOS (Metadata Object storage)

Correct Option: c

Detailed Solution: DOS generally stores the cloud subscriber's metadata like user credentials and OS images.

QUESTION 2:

Universal Description, Discovery, and Integration (UDDI) represents a format for data exchange, designed to hold and convey data objects that are made up of pairs of attributes and values.

a) True
b) False

Correct Answer: a

Detailed Solution: Universal Description, Discovery, and Integration (UDDI) is an XML based registry for business internet services. JavaScript Object Notation (JSON) is a data interchange format to store and transmit data objects consisting of attribute-value pairs.

QUESTION 3:

Which factors should an organization consider while planning to deploy an outsourced private cloud?

a) Only Network Dependency
b) Only Risks from multi-tenancy
c) Both Network Dependency and Risks from multi-tenancy
d) Neither Network Dependency nor Risks from multi-tenancy

Correct Answer: c

Detailed Solution: For outsourced private cloud, subscribers may have an option to provide a

unique, protected, and reliable network. Additionally, there is always a risk of multi-tenancy.

QUESTION 4:

What is/are the main difference(s) between virtualization and dual boot?

a) In virtualization, both operating systems run simultaneously, but not in dual boot.
b) In virtualization, operating systems are not isolated from each other, but not in dual boot.
c) In a dual boot, both operating systems run simultaneously, but not in virtualization.
d) No difference between dual boot and virtualization.

Correct Option: a
Detailed Solution: Virtualization is a method of running multiple operating systems and user applications on the same hardware. Both OSs run simultaneously and are completely isolated from each other.

QUESTION 5:

Web services enhance distributed interoperability through the use of open standards, enabling any two software components to communicate and are designed to address firewall issues.

a) True
b) False

Correct Answer: a
Detailed Solution: Web services indeed improve distributed interoperability by utilizing open standards, which allows different software components to communicate effectively. Additionally, they are designed to navigate and resolve firewall issues, making them suitable for use across various network configurations.

QUESTION 6:

Ubuntu Enterprise Cloud (UEC) is an example of

a)Public cloud
b) Hybrid cloud
c)Private cloud
d) Community Cloud

Correct Option: c
Detailed Answer: Ubuntu Enterprise Cloud (UEC) is an example of a private clou**d.**

QUESTION 7:

Cloud Manager is the public access point to the cloud where subscribers _____ up for accounts and has a mechanism for _____ subscribers.

a) sign, integrating
b) sign, authenticating
c) sign, accessing
d) access, authenticating

Correct Answer: b
Detailed Solution: Cloud Manager is the public access point to the cloud where subscribers sign up for accounts and has a mechanism for authenticating subscribers.

QUESTION 8:

Hypervisor is also known as

a) Cluster Manager
b) Virtual Machine Handler
c) Virtual Machine Manager
d) Virtual Machine Monitor

Correct Answer: d
Detailed Solution: The hypervisor is also known as Virtual Machine Monitor

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QUESTION 9:

Simple Object Access Protocol (SOAP) provides a way to communicate between applications running on different operating systems, with the same technologies and programming languages.

a) True
b) False

Correct Answer: b
Detailed Solution: Simple Object Access Protocol (SOAP) provides a way to communicate between applications running on different operating systems, with different technologies and programming languages.

QUESTION 10:

While DOM operates on the documents as a whole, _____ parsers operate on each piece of the XML document sequentially.

a) FTP
b) MQTT
c) SAX
d) XAS

Correct Answer: c
Detailed Solution: DOM operates on the documents as whole, SAX parsers operate on each piece of the XML document sequentially.

Cloud Computing

Assignment- Week 3

TYPE OF QUESTION: MCQ/MSQ

Number of questions: **10** **Total mark: 10 X 1 = 10**

QUESTION 1:

Which of the following system/ architecture follow(s) Quorum protocol for a large number of concurrent reads & writes?

(a) Google File System (GFS)
(b) BigTable
(c) Dynamo
(d) None of the above

Correct Option: c
Detailed Solution: Dynamo follows Quorum protocol for a large number of concurrent reads & writes.

QUESTION 2:

Statement 1: In ephemeral storage, the stored objects persist until the VM is terminated.

Statement 2: The ephemeral storage is managed by Cinder in OpenStack.

(a) Statement 1 is TRUE, Statement 2 is FALSE
(b) Statement 2 is TRUE, Statement 1 is FALSE
(c) Both statements are TRUE
(d) Both statements are FALSE

Correct Answer: a
Detailed Solution: Ephemeral storage is managed by NOVA in OpenStack.

QUESTION 3:

Column-oriented storage is efficient for data-warehouse workloads.

(a) TRUE
(b) FALSE

Correct Answer: a
Detailed Solution: From the definition of data storage techniques. (Slide no. 6 of Cloud Computing: Managing Data)

QUESTION 4:

Horizon is a _____ self-service portal to interact with underlying OpenStack services

a) mobile based
b) OS based
c) web based
d) None of the above

Correct Option: c
Detailed Solution: Horizon provides a web-based self-service portal to interact with underlying OpenStack services, such as launching an instance, assigning IP addresses and configuring access controls

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QUESTION 5:

What is the parallel efficiency (Eff) of an algorithm, when a task takes time T in uniprocessor system, P is number of processors, M is time taken by each processor?

(a) Eff = (T*P)/M

(b) Eff = T*(M/P)

(c) Eff = T*P*M

(d) Eff = T/(P*M)

Correct Answer: d
Detailed Solution: Eff = T/(P*M) is the parallel efficiency(Eff) of an algorithm.

QUESTION 6:

In cloud, service downtime is 30 minutes and availability of the service is 0.80. What is the service uptime?

(a) 120 minutes
(b) 60 minutes
(c) 150 minutes
(d) 135 minutes

Correct Option: c
Detailed Answer: Availability = 1 – (downtime/uptime).
Uptime = Downtime/(1-Availability) = 30/(1-0.8) = 150 minutes

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QUESTION 7:

Which of the following is/are NOT SLA requirement(s) of PaaS cloud delivery model?

a. Data Retention and Deletion
b. Privacy
c. Machine-Readable SLAs
d. Certification

Correct Answer: a,c
Detailed Solution: Data Retention and Deletion and Machine-Readable SLAs are not SLA requirements with respect to Paas cloud delivery model.

QUESTION 8:

What does the 'availability' metric represent in the monitoring and auditing of SLAs?

a) The speed at which a service responds
b) How often the service is available
c) The ability for a resource to grow infinitely
d) The percentage of uptime for a service

Correct Answer: d
Detailed Solution: availability is represented as a percentage of uptime for a service in a given observation period.

QUESTION 9:

What architecture is used in a parallel database for the efficient execution of SQL queries?

a) Shared memory architecture
b) Shared disk architecture
c) Shared nothing architecture
d) Shared cache architecture

Correct Answer: c
Detailed Solution: For shared-nothing architecture in the parallel database, tables are partitioned and distributed across multiple processing nodes and SQL optimizer handles distributed joins

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QUESTION 10:

_____ is used for networking services in OpenStack.

a) Keystone
b) Neutron
c) Cinder
d) Swift

Correct Answer: b
Detailed Solution: Neutron is used for networking services in OpenStack.

Cloud Computing

Assignment- Week 4

TYPE OF QUESTION: MCQ/MSQ

Number of questions: **10** **Total mark: 10 X 1 = 10**

QUESTION 1:

Which of the following statement(s) is/are FALSE for Microsoft Azure Resource Group?

(a) It is a logical container
(b) It manages Azure resources
(c) It deploys web apps, databases, and storage accounts
(d) It is a physical container

Correct Option: d

Detailed Solution: A resource group is a logical container into which Azure resources like web apps, databases, and storage accounts are deployed and managed. Hence, D is the only incorrect option.

QUESTION 2:

Statement 1: Azure supports public cloud platforms.

Statement 2: Azure App Service plan defines security.

(a) Statement 1 is TRUE, Statement 2 is FALSE
(b) Statement 2 is TRUE, Statement 1 is FALSE
(c) Both statements are TRUE
(d) Both statements are FALSE

Correct Answer: a

Detailed Solution: Microsoft Azure is Microsoft's public cloud computing platform. Azure App Service Plan is the container for hosting Web Apps, API Apps, Mobile Apps and Function Apps.

QUESTION 3:

Google Cloud Datastore provides flexible object storage with global edge caching.

(a) TRUE
(b) FALSE

Correct Answer: a

Detailed Solution: Google Cloud Storage, not Datastore provides flexible object storage with global edge caching. So the statement is false

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QUESTION 4:

Google APIs help to:

a) scale up the app according to the demand/ service requests.
b) integrate Google's services into the application.
c) migrate the web app to Google Cloud Platform.
d) None of the above

Correct Option: b
Detailed Solution: Google APIs help to integrate Google's services into the application.

QUESTION 5:

Which of the following is/are storage service(s) provided by Google Cloud Platform(GCP)?

(a) Cloud SQL

(b) BigQuery

(c) Cloud Datastore

(d) Cloud Endpoints

Correct Answer: a, c
Detailed Solution: Cloud SQL and Cloud Datastore are the storage services mentioned here provided by GCP. Hence, A and C are correct..

QUESTION 6:

Match the following columns:

Column I	Column II
A. GoogleAppEngine B. GoogleCloudEndpoints C. GoogleAPI	1. Integrates Google's services into end users' application 2. Helps end users' application scalability 3. Helps to migrate web application to Google Cloud Platform

a) A-3, B-2, C-1
b) A-1, B-2, C-3
c) A-3, B-1, C-2
d) A-2, B-1, C-3

Correct Option: a

Detailed Answer: GoogleAppEngine helps to migrate web applications to Google Cloud Platform. GoogleCloudEndpoints help end users' application scalability. GoogleAPIs integrate Google's services into end users' applications. So, the correct option is A.

QUESTION 7:

In OpenStack, when a VM is terminated, which of the following memory resources are freed?

a. Ephemeral storage
b. Block Storage
c. Persistent Storage
d. RAM

Correct Answer: a, d

Detailed Solution: In OpenStack, ephemeral storage and RAM are freed when a VM is terminated.

QUESTION 8:

Statement 1: When deploying the Azure app remotely, the login password of the Azure account needs to be entered when the system asks for password.

Statement 2: In Microsoft Azure, a deployment user is required for FTP and local Git deployment to a web app.

A. Statement 1 is True and Statement 2 is False
B. Statement 1 is False and Statement 2 is True
C. Both are True
D. Both are False

Correct Option: b

Detailed Answer: A deployment user is required for FTP and local Git deployment to a web app in Microsoft Azure. When deploying the Azure app remotely, the password created while configuring the deployment user should be used, not the password used to log in to the Azure portal. So the correct option is B.

QUESTION 9:

The Azure App pan has a scale count of ____ instances.

(a) 1 to 10
(b) 1 to 100
(c) 1 to 50
(d) 1 to 20

Correct Answer: d

Detailed Solution: The Azure App pan has a scale count of 1 to 20 instances.

QUESTION 10:

While developing a web-app using Google App Engine, the development server should not be kept running when changes are made to the source file.

a) TRUE

b) FALSE

Correct Option: b

Detailed Answer: The development server can be kept running while the application is being developed in Google App Engine. The development server watches for changes in the source files and reloads them if necessary. Hence, the statement is false.

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Cloud Computing

Assignment- Week 5

TYPE OF QUESTION: MCQ/MSQ

Number of questions: **10** **Total mark: 10 X 1 = 10**

QUESTION 1:

____ is a formal contract between a Service Provider (SP) and a Service Consumer (SC).

A. SLO

B. SLA

C. KPI

D. Utility Premium

Correct Option: B

Detailed Answer: SLA (Service Level Agreement) is a formal contract between a Service Provider (SP) and a Service Consumer (SC) in slide 2 of SLA. So the correct option is B.

QUESTION 2:

Statement 1: SLA contains SLO.

Statement 2: Multiple KPIs are aggregated to SLA.

A. Statement 1 is TRUE and Statement 2 is FALSE

B. Statement 2 is TRUE and Statement 1 is FALSE

C. Both statements are TRUE

D. Both statements are FALSE

Correct Answer: A

Detailed Solution: SLA contains SLO. Multiple KPIs are aggregated to SLO. So statement 1 is correct and statement 2 is incorrect.

QUESTION 3:

If demand is flat, the penalty will be linear.

A. TRUE

B. FALSE

Correct Answer: B

Detailed Solution: If demand is flat, the penalty will be zero.

QUESTION 4:

What is/are the correct statement(s) regarding VM load management?

A. When load increases, new VMs should be scheduled to new nodes.

B. When load decreases, use WOL to start up waiting nodes.

C. When load increases, use WOL to start up waiting nodes.

D. When load decreases, live migrate VMs to more utilized nodes.

Correct Option: A, C, D

Detailed Answer: When load decreases, VMs should be live migrated to more utilized nodes. When load increases, WOL should be used to start up waiting nodes and new VMs should be scheduled to new nodes.

QUESTION 5:

A company XYZ needs to support a spike in demand when it becomes popular followed potentially by a reduction once some of the visitors turn away. The company has two options to satisfy the requirements which are given in the following table:

Expenditure	**In-house server (INR)**	**Cloud server (INR)**
Purchase cost	1,80,000	—
Cost/hour (over three-year span)	—	32
Efficiency	60%	80%
Power and cooling (cost/hour)	25	—
Management cost (cost/hour)	10	2

Select the correct statement(s) regarding the value(s) of (total-cost/effective-hour) for both the options.

A. Total-cost / Effective-hour for in-house server is 81.42 INR over three years.

B. Total-cost / Effective-hour for cloud server is 42 INR.

C. Total-cost / Effective-hour for in-house server is 46.42 INR over three years.

D. Total-cost / Effective-hour for cloud server is 40 INR.

Correct Answer: B, C

Detailed Solution: For in-house server:

Cost/hour = 1,80,000/(3*365*24) = 6.849 INR (Time is given as a three year span.)

Cost/Effective-hour = Cost/hour * (1/efficiency) = 6.489*(100/60) ~ 11.42 INR

Total cost/Effective-hour = 11.42 + 25 + 10 = **46.42 INR**

Power and cooling and management cost should not be multiplied with efficiency.

For cloud server:

Cost/hour = 32 INR

Cost/Effective-hour = Cost/hour * (1/efficiency) = 32*(100/80) = 40 INR

Total cost/Effective-hour = 40 + 2 = **42 INR**.

QUESTION 6:

A third-party application runs in the cloud for 12 hours/day. At the end of one month [30 days], it was found that the cloud service suffered 5 outages of durations: 1 hour 30 minutes, 30 minutes, 2 hours 15 minutes, 1 hour 45 minutes and T hours, each on different days over the service period. Suppose a cloud guarantees service availability for 97% of time. What are the possible value(s) of T that SLA negotiation gets honored in terms of service availability?

A. 3 hours
B. 6 hours
C. 12 hours
D. 8 hours

Correct Option: A

Explanation: Total Outage: (6+T) hours, application runs for 360 hours in a month. Availability = 1 - (downtime/uptime). For availability: [1- {(6+T)/(354-T)}] >= 0.97, T<=4.48. Option A is correct.

QUESTION 7:

Which of the following is/are objective(s) of Resource Management?

A. Increased latency
B. Scalability
C. Improved throughput
D. Improved security

Correct Option: B, C

Detailed Answer: From the objectives outlined in slide 9 of Resource Management - II.

QUESTION 8:

Which of the following is/are resource allocation approaches in resource management?

A. Energy-aware resource allocation
B. Reinforcement learning guided control policy
C. Network queueing model
D. Intelligent multi-agent model

Correct Answer: A, D

Detailed Solution: Energy-aware resource allocation and intelligent multi-agent model are resource allocation approaches. Network queueing model is a resource provisioning approach and reinforcement learning guided control policy is a resource adaptation approach..

QUESTION 9:

Statement 1: Each reducer groups the results of the map step using different keys and performs a function f on the list of values that correspond to these keys.

Statement 2: Files are sorted by a key and stored to the local file system.

A. Statement 1 is TRUE and Statement 2 is FALSE
B. Statement 2 is TRUE and Statement 1 is FALSE
C. Both statements are TRUE
D. Both statements are FALSE

Correct Answer: B
Detailed Solution: Each reducer groups the results of the map step using the same keys and performs a function f on the list of values corresponding to the keys. So statement 1 is false. Statement 2 is true.

QUESTION 10:

In computing, there is a nonlinear relationship between the number of processing cores used and power consumption

A. TRUE
B. FALSE

Correct Option: A

Detailed Answer: Refer to slide 10 of resource management-I.

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Cloud Computing

Assignment- Week 6

TYPE OF QUESTION: MCQ/MSQ

Number of questions: **10** **Total mark: 10 X 1 = 10**

QUESTION 1:

Modification is an attack on:

A) Authenticity

B) Integrity

C) Confidentiality

D) Availability

Correct Option: B

Detailed Solution: Modification is an attack on integrity.

QUESTION 2:

Which of the following is/are example(s) of passive attack?

A) Replay

B) Denial of service

C) Traffic analysis

D) Masquerade

Correct Option: C

Detailed Solution: Traffic analysis is an example of passive attack.

QUESTION 3:

Which of the following is/are the recovery goal(s) of the security mechanism?

A) Prevent attackers from violating security policy

B) Detect attackers' violation of security policy

C) Stop attack, assess and repair damage

D) Continue to function correctly even if attack succeeds

Correct Option: C, D

Detailed Solution: Refer slide no. 8 of Cloud-Security I.

QUESTION 4:

Statement I: Authorization is the identification of legitimate users.

Statement II: Integrity is the protection against data alteration/corruption.

A. Statement I is TRUE and statement II is FALSE.

B. Statement I is FALSE and statement II is TRUE.

C. Both statements are TRUE.

D. Both statements are FALSE.

Correct Option: B

Detailed Solution: Refer slide no. 18 of Cloud-Security I. Authorization is the determination of whether or not an operation is allowed by a certain user. Integrity is the protection against data alteration/corruption. So the first statement is false and the second statement is true.

QUESTION 5:

Which of the following is/are hypervisor risks associated with rogue hypervisor rootkits?

A) Vulnerable virtual machine applications like Vmchat, VMftp, Vmcat etc.

B) Hypervisor that hides itself from normal malware detection systems

C) Improper configuration of VM.

D) Hypervisor that creates a covert channel to dump unauthorized code.

Correct Answer: B, D

Detailed Solution: Hypervisor risks associated with rogue hypervisor rootkits include hypervisors that hide themselves from normal malware detection systems, and hypervisors that create a covert channel to dump unauthorized code.

QUESTION 6:

1. Injection attack	(a) Attacker sending huge amounts of requests to a certain service and causing denial of service.
2. Flooding	(b) Browser-based security issues.
3. Metadata (WSDL) spoofing attack	(c) Introduce malicious code to change the course of execution.
	(d) Malicious reengineering of Web Services' metadata description.

A) 1-(a), 2-(b), 3-(d)

B) 1-(c), 2-(a), 3-(d)

C) 1-(b), 2-(c), 3-(d)

D) 1-(a), 2-(c), 3-(d)

Correct Option: B

Detailed Solution: The following are web service based attacks. Refer to slide 23 of Cloud Security-II.

QUESTION 7:

Recovery Time Objective (RTO) represents the period of time allowed for the complete execution of the task.

A) TRUE

B) FALSE

Correct Option: B

Detailed Solution: Recovery Time Objective (RTO) represents the period of time allowed for recovery i.e., the time that is allowed to elapse between the disaster and the activation of the secondary site.

QUESTION 8:

Which of the following Open-source tools is/are used to perform TCP connect probes on the Amazon EC2 platform?

A) nmap
B) wget
C) ipconfig
D) hping

Correct Option: A

Detailed Solution: nmap is used to perform TCP connect probes (attempt to complete a 3-way hand-shake between a source and target). Refer to slide 12 of Cloud Security III.

QUESTION 9:

In para virtualization, VMs interact with the host OS.

A) TRUE

B) FALSE

Correct Option: A

Detailed Solution: The statement is true. Refer page 19 of Cloud Security-II.

QUESTION 10:

In conflict removal, when is introduction of a virtual role required?

A) In case of violation of SoD constraint violation.

B) In case of cyclic inheritance conflict where exactly matched role set exists.
C) In case of cyclic inheritance conflict where no exactly matched role set exists.
D) None of the above.

Correct Option: C

Detailed Solution: Refer page 27 of Cloud Security-III on conflict removal.

Cloud Computing

Assignment- Week 7

TYPE OF QUESTION: MCQ/MSQ

Number of questions: **10** **Total mark: 10 X 1 = 10**

QUESTION 1:

Which of the following is/are key requirement(s) of Mobile Cloud Computing?

A) Simple APIs offering access to mobile services
B) Internet access to remotely stored applications in the cloud
C) Sophisticated APIs requiring knowledge of underlying network technologies
D) Web interface

Correct Answer: A, B, D
Detailed Solution: Refer slide 12 of Mobile Cloud Computing - I.

QUESTION 2:

In Mobile Cloud Computing, the synchronizer module collects results of split execution and combines them, and makes the execution details transparent to the user.

A) TRUE
B) FALSE

Correct Answer: A
Detailed Solution: Task of synchronizer modules is to collect results of split execution and combine, and make the execution details transparent to the user. So, the correct option is A.

QUESTION 3:

Geographical distribution of server nodes is _____ in Fog Computing and _____ in Cloud Computing.

A) Distributed, Centralized
B) Distributed, Distributed
C) Centralized, Distributed
D) Centralized, Centralized

Correct Answer: A

Detailed Solution: Geographical distribution of server nodes is Distributed in Fog Computing, and Centralized in Cloud Computing. So, the correct option is A.

QUESTION 4:

Formulate the amount of energy saved (E) during offloading for the given data.
Energy cost/second while when mobile phone is doing computation = C1
Energy cost/second while when mobile phone is idle = C2

Energy cost/second while when mobile phone is transmitting the data = C3
Speed of cloud to compute **k** instructions = Sc
Speed of mobile to compute **k** instructions = Sm
Data need to transmit = D
Bandwidth of the wireless Internet = B

A) E = C2*(k/Sm) - C1*(k/Sc) - C3*(D/B)
B) E = C1*(k/Sm) - C2*(k/Sc) - C3*(D/B)
C) E = C3*(k/Sm) - C2*(k/Sc) - C1*(D/B)
D) E = C1*(k/Sc) - C2*(k/Sm) - C3*(D/B)

Correct Answer: B
Detailed Solution: Refer slide 37 of Mobile Cloud Computing - I and Lecture 32.

QUESTION 5:

Which of the following is/are not a benefit of Fog computing?

A) Location awareness
B) Higher latency as compared to cloud computing
C) Improved QoS
D) Man-in-the-middle-attack

Correct Answer: B, D
Detailed Solution: Fog results in low latency, which is one of its major benefits. As the computing data is over dispersed edge devices, there may occur issues like Man-in-the-middle-attack. So, the correct answers are B and D.

QUESTION 6:

Population of a city/town is a static geographic information.

A)TRUE
B)FALSE

Correct Answer: B
Detailed Solution: Population of a city is a dynamic geographic information.

QUESTION 7:

Which of the following statement(s) is/are FALSE about Fog Computing?

A) Intelligence is brought to the cloud from the end users.
B) Fog computing is used for real-time applications
C) Fog nodes' response time is higher than cloud server
D) Network routers, WiFi Gateways will be capable of running applications

Correct Answer: A, C

Detailed Solution: Fog computing brings intelligence to end users from the cloud, it is used for real-time applications, Fog nodes' response time is much lower than cloud server, network routers, WiFi Gateways will be capable of running applications. So, the correct options are A and C.

QUESTION 8:

Fog Computing has _____ number of server nodes and has _____ delay jitter compared to Cloud Computing.

A) small, higher

B) large, higher

C) small, lower

D) large, lower

Correct Answer: D

Detailed Solution: Fog Computing has a very large number of server nodes and has lower delay jitter compared to Cloud Computing. Hence, the correct answer is D.

QUESTION 9:

In Geospatial Cloud Models, which level of interoperability ensures the ability to "consume" the information?

A) Service Level Interoperability
B) Security Level Interoperability
C) Data Level Interoperability
D) None of the above

Correct Answer: C
Detailed Solution: Data Level Interoperability ensures the ability to "consume" the information. So the correct option is C. Refer to interoperability in Challenges in Geospatial Cloud.

QUESTION 10:

Consider the statements and select the correct answer:
Statement I: In Geospatial cloud, data services in cloud can be run through IaaS service model.
Statement II: Web service is the key technology to provide Geospatial services.

A) Statement 1 is correct but Statement 2 is incorrect

B) Statement 2 is correct but Statement 1 is incorrect

C) Both the statements are correct

D) Both the statements are incorrect.

Correct Answer: B
Detailed Solution: In Geospatial cloud, data services in cloud can be run through PaaS service model. Web service is the key technology to provide Geospatial services. Hence, B is the correct answer.

Cloud Computing

Assignment- Week 8

TYPE OF QUESTION: MCQ/MSQ

Number of questions: **10** **Total mark: 10 X 1 = 10**

QUESTION 1:

Docker compose is a tool for defining and running multi-container Docker applications.

a) True

b) False

Correct Answer: a

Detailed Solution: Docker compose is a tool for defining and running multi-container Docker applications. So, the correct option is (a). Lecture 36, 18:17 min.

QUESTION 2:

Choose the most appropriate option.

Statement 1: An image is a lightweight, stand-alone, executable package that includes everything to run a piece of software.

Statement 2:Container is a run time instance of an image.

a. Statement 1 is correct but Statement 2 is incorrect

b. Statement 2 is correct but Statement 1 is incorrect

c. Both the statements are correct

d. Both the statements are incorrect.

Correct Answer: c

Detailed Solution: Both the statements are correct. Lecture 36, 20:51 min

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QUESTION 3:

Vehicles providing their networking and data processing capabilities to other vehicles through the cloud comes under which service of IoT-based Vehicular Data Clouds.

a. SaaS

b. PaaS

c. IaaS

d. None of these

Correct Answer: c

Detailed Solution: Vehicles provide their networking and data processing capabilities to other vehicles through the cloud comes under the Networking and Data processing as a service (IaaS)

of IoT-based Vehicular Data Clouds under IaaS service. Hence, the correct option is (c). Lecture 39, 28:02 min.

QUESTION 4:

An IoT platform's basic building blocks is/ are (choose the correct option(s)).
a. Gateway
b. Images
c. Network and Cloud
d. Containers

Correct Answer: a, c
Detailed Solution: An IoT platform has three basic building blocks, Things, Gateway, and Network and Cloud. Lecture 39, 10:09 min.

QUESTION 5:

In the context of Green Cloud Computing, the Power Usage Effectiveness is defined as
a. Power Delivered / Overall Power
b. Overall Power / Power Delivered
c. Overall Power * Power Delivered
d. None of these

Correct Answer: b
Detailed Solution: In the context of Green Cloud Computing, the Power Usage Effectiveness is defined as Overall Power / Power Delivered. So, the correct option is (b). Lecture 37, 28:45 min.

QUESTION 6:

Statement 1: Sensor-Cloud proxy exposes sensor resources as cloud services.

Statement 2: Sensor network is still managed from the Sensor-Cloud Interface via Sensor Network Proxy

a. Statement 1 is True and Statement 2 is False

b. Statement 2 is True and Statement 1 is False

c. Both statements are True

d. Both statements are False

Correct Answer: c

Detailed Solution: Sensor cloud proxy exposes sensor resources as cloud services.

Sensor network is still managed from the Sensor-Cloud

Interface via Sensor Network Proxy. Lecture 38, 21:43 min.- 22:09 min

QUESTION 7:

Which of the following statements is/are true about Docker ?

Statement 1: Docker hub is used for building docker images and creating docker containers.

Statement 2: Docker compose is a registry used to host various docker images.

a. Statement 1 is correct but Statement 2 is incorrect

b. Statement 2 is correct but Statement 1 is incorrect

c. Both the statements are correct

d. Both the statements are incorrect.

Correct Answer: d

Detailed Solution: Docker Engine is used for building docker images and creating docker containers. Docker Hub is a registry used to host various docker images.

So, the correct option is (d). Lecture 36,17:34.

QUESTION 8:

Sensor data can be easily shared by different groups of users without any extra effort/ measure.

a. True

b. False

Correct Answer: b

Detailed Solution: One of the limitations of Sensor Networks is “Sensor data can not be easily shared by different groups of users.” Hence, the correct option is (b). Lecture 38, 9:32 min.

QUESTION 9:

_____ get virtual access to host resources through a hypervisor.

a) Containers

b) Virtual machines

c) Both a and b

d) Images

Correct Answer: b

Detailed Solution: Virtual machines get virtual access to host resources through a hypervisor. So, the correct option is (b). Lecture 36, 24:10

QUESTION 10:

_____ enables different networks, spreads in a huge geographical area to connect together and be employed simultaneously by multiple users on demand.

a) Serverless

b) IoT Cloud

c) Sensor Cloud

d) Green Cloud

Correct Answer: c

Detailed Solution: Sensor Cloud enables different networks, spreads in a huge geographical area to connect together and be employed simultaneously by multiple users on demand. Lecture 38, 20:27

Cloud Computing

Assignment- Week 9

TYPE OF QUESTION: MCQ/MSQ

Number of questions: **10** **Total mark: 10 X 1 = 10**

QUESTION 1:

In which of the following architectures, two or more partner clouds interoperate to aggregate their resources and provide users with a larger virtual infrastructure?

A) Hybrid/Bursting Architecture

B) Aggregated Architecture

C) Broker Architecture

D) Multiplier Architecture

Correct Answer: B

Detailed Solution: In aggregated cloud federation architecture, two or more partner clouds interoperate to aggregate their resources and provide users with a larger virtual infrastructure.

QUESTION 2:

Select the correct statement(s) regarding offloading.

A) Offloading is a technique in which a server, an application, and the associated data are moved from the edge to the cloud.

B) Offloading augments the computing requirements of individuals or a collection of user devices.

C) Offloading from cloud to the edge can be achieved by server offloading.

D) Offloading from user device to edge can be achieved by application partitioning.

Correct Answer: B, C, D

Detailed Solution: Offloading is a technique in which a server, an application, and the associated data are moved onto the edge of the network. Hence, A is false. All the other statements are correct. Refer to slide-12 of Resource Management - II.

QUESTION 3:

Fog computing is a model in which data, processing and applications are concentrated in devices at the _____ rather than existing almost entirely in the cloud.

a. fog

b. local node

c. network station

d. network edge

Correct Answer: d

Detailed Solution: Fog computing is a model in which data, processing and applications are concentrated in devices at the network edge rather than existing almost entirely in the cloud. So the option is (d).

QUESTION 4:

According to the service placement taxonomy in fog-edge computing, which of the following can be classified as online vs offline?

A) Control plan design
B) Placement characteristic
C) System dynamicity
D) Mobility support

Correct Answer: B

Detailed Solution: According to the service placement taxonomy in fog-edge computing, placement characteristic can be classified as online vs offline.

QUESTION 5:

Fog infrastructure consisting of IoT devices, Fog Nodes, and at least one Cloud Data Center never ensures scalability

a. True
b. False

Correct Answer: b

Detailed Solution: Scalability is one of the characteristics of fog computing.

QUESTION 6:

Cloud Federation should prefer maximum geographical separation.

a. True

b. False

Correct Answer: a

Detailed Solution: Cloud Federation should prefer maximum geographical separation.

QUESTION 7:

In which of the following cloud federation architectures, creation of cross-site networks and cross-site migration of VMs are used?

A) Loosely coupled federation

B) Partially coupled federation

C) Tightly coupled federation

D) None of the above

Correct Answer: C

Detailed Solution: Advanced features like creation of cross-site networks and cross-site migration of VMs are found in tightly coupled federation.

QUESTION 8:

What is(are) the application placement constraint(s) for fog nodes?

a. Network constraints
b. Interoperability
c. Resource constraints
d. None of these

Correct Answer: A,C
Detailed Solution: Network constraints: such as latency, bandwidth, etc. and these constraints need to be considered when deploying applications.
Resource constraints: an infrastructure node is limited by finite capabilities in terms of CPU, RAM, storage, bandwidth, etc. While placing application(s) (service components), the resource requirements need to be considered.

QUESTION 9:

The _____ used for resource management in fog/edge computing are classified on the basis of data flow, control and tenancy.
a. Algorithms
b. Architectures
c. Hardware
d. Infrastructure

Correct Answer: b
Detailed Solution: The architectures used for resource management in fog/edge computing is classified based on data flow, control, and tenancy.

QUESTION 10:

A CSP has little or no control over remote resources in case of
a. Tightly Coupled Federation
b. Medium Coupled Federation
c. Loosely Coupled Federation
d. None of these

Correct Answer: c
Detailed Solution: In loosely coupled federation, a CSP has little or no control over remote resources (for example, decisions about VM placement are not allowed), monitoring information is

limited (for example, only CPU, memory, or disk consumption of each VM is reported), and there is no support for advanced features such as cross‑site networks or VM migration.

Cloud Computing

Assignment- Week 10

TYPE OF QUESTION: MCQ/MSQ

Number of questions: **10** **Total mark: 10 X 1 = 10**

QUESTION 1:

Post-copy and Pre-copy migration approaches are employed in :

a. Live Migration process

b. Non-live Migration process

c. Hybrid Migration process

d. None of these

Correct Answer: a

Detailed Solution: Both Post-copy and Pre-copy are approaches for the live migration process.

QUESTION 2:

Kubernetes operates at the hardware level.

a. True

b. False

Correct Answer: b

Detailed Solution: Kubernetes operates at the container level. (Slide 96)

QUESTION 3:

What is(are) the key advantage(s) of Docker?

a. Facilitating microservices

b. Modeling networks.

c. Packaging software

d. None of these

Correct Answer: a,b,c

Detailed Solution: Facilitating microservices, packaging software, and modeling networks for initiating multiple isolated containers on a single machine, are the key advantages of Docker. (slide - 73)

QUESTION 4:

Which of the following statements is most appropriate about Docker ?

a. Docker is a platform that allows to build and run but not ship apps.

b. Docker is a platform that allows to build and ship but but not to run apps.

c. Docker is a platform that allows to build, ship and, run apps.

d. Docker is a platform that only allows to ship and run but not to build apps.

Correct Answer: c

Detailed Solution: Docker is a platform that allows to build, ship and, run any app anywhere. (page - 65)

QUESTION 5:

In Docker utility, _____ is a collection of filesystem layers and some metadata that, if taken together, can be spun up as Docker containers.

a. Operating System

b. Microservice

c. Virtual Machine

d. Image

Correct Answer: d

Detailed Solution: In Docker utility, an image is a collection of filesystem layers and some metadata which if taken together, can be spun up as Docker containers. (slide - 77)

QUESTION 6:

Containers are similar to VMs but they have unrelaxed isolation properties to share the operating system among the applications.

a. True

b. False

Correct Answer: b

Detailed Solution: Containers are similar to VMs but they have relaxed isolation properties to share operating systems among the applications. Therefore, containers are considered lightweight.

QUESTION 7:

Choose the most appropriate option.

Statement 1: Container is a lightweight virtualization technique.

Statement 2: Container contains the code and all its dependencies.

a. Only statement 1 is true

b. Only statement 2 is true

c. Both statement 1 and 2 are true

d. Bothe the statements are false

Correct Answer: c

Detailed Solution: Container is a lightweight virtualization technique. Container contains the code and all its dependencies so the applications run quickly. (slide - 46)

QUESTION 8:

Private Docker registry is a service that stores Docker images.

a. True

b. False

Correct Answer: a

Detailed Solution: Private Docker registry is a service that stores Docker images.

Moreover, Docker on the host machine is split into two parts- a daemon with RESTful API and a client who talks with the daemon.

QUESTION 9:

Docker builds offer enhanced reproducibility and replicability compared to conventional software development approaches.

a. True

b. False

Correct Answer: a

Detailed Solution: Docker builds are more reproducible and and replicable than traditional software building methods. This makes implementing CD much easier. (Slide - 76)

QUESTION 10:

Given the VM memory size of 1024 GB and the transmission rate of 16 MB/sec
What are the total migration time and downtime for non-live VM migration? Choose the most appropriate option.
a. 20 hours, 25 hours
b. 18 hours,18 hours
c. 16 hours, 16 hours
d. 24 hours,20 hours

Correct Answer: b
Detailed Solution: Total Migration time = VM memory size/ transmission rate
=(1024x2^30)/(16x2^20)=65536 secs= 18 hours.
For non-live migration, overall migration time is the same as overall downtime.

Cloud Computing

Assignment- Week 11

TYPE OF QUESTION: MCQ/MSQ

Number of questions: **10** **Total mark: 10 X 1 = 10**

QUESTION 1:

Which of the following options is most appropriate for FaaS ?

Statement 1: Each function in the FaaS platform gets unlimited execution time.

Statement 2: Functions are always active and ready for execution.

a. Statement 1 is correct but Statement 2 is incorrect.

b. Statement 2 is correct but Statement 1 is incorrect.

c. Both the statements are correct.

d. Both the statements are incorrect.

Correct Answer: d

Detailed Solution: A function in FaaS typically has limited execution time. Functions are not constantly active. FaaS platform listens for the events that instantiate the functions. So, the correct option is (d).

QUESTION 2:

BigQuery is a fully-managed, serverless data warehouse by _____.

a. AWS

b. Google

c. Microsoft

d. IBM

Correct Answer: b

Detailed Solution: BigQuery is a fully-managed, serverless data warehouse that enables scalable analysis over petabytes of data by Google. So, the correct option is (b).

QUESTION 3:

_____are an important distribution mechanism for libraries and custom runtimes in AWS serverless ecosystem.

a. Runtimes

b. Lambda Layers

c. Log streams

d. None of these

Correct Answer: b
Detailed Solution: Lambda layers are an important distribution mechanism for libraries, custom runtimes and other imp function dependencies in AWS serverless ecosystem. So, the correct option is (b).

QUESTION 4:

Which of the following is not a category of research initiative on sustainable cloud computing?
a. Renewable Energy
b. Capacity planning
c. Environment Sandboxing
d. None of these

Correct Answer: c

Detailed Solution: Environment Sandboxing is not a category of research initiative on sustainable cloud computing. The other two options are. So, the correct option is (c).

QUESTION 5:

AWS S3 is a fully managed proprietary NoSQL database service that supports key–value and document data structures and is offered by Amazon.com as part of the Amazon Web Services portfolio.
a. True
b. False

Correct Answer: b
Detailed Solution: Amazon DynamoDB is a fully managed proprietary NoSQL database service that supports key–value and document data structures and is offered by Amazon.com as part of the Amazon Web Services portfolio. Whereas, Amazon S3 is a simple storage service . So, the correct option is (b).

QUESTION 6:

Which of the following is/are the goal of sustainable cloud computing? Choose appropriate option(s).
a. Minimizing the energy consumption.
b. Increasing reliability of CDCs.
c. Maximizing carbon footprint related cost.
d. Increasing network traffic

Correct Answer: a,b
Detailed Solution: Focus on minimizing the energy consumption and carbon footprint and ensuring reliability of CDCs is the goal of sustainable cloud computing.

QUESTION 7:

Runtimes allows you to annotate your function code with custom logging statements which helps

you to analyse the execution flow and performance of your AWS Lambda functions.

a. True

b. False

Correct Answer: b

Detailed Solution: Log stream allows you to annotate your function code with custom logging statements which helps you to analyse the execution flow and performance of your AWS Lambda functions. . So, the correct option is (b).

QUESTION 8:

Serverless covers a wide range of technologies that can be grouped into two categories

a. BaaS and YaaS

b. FaaS and BaaS

c. FaaS and YaaS

d. None of these

Correct Answer: b

Detailed Solution: Serverless covers a wide range of technologies that can be grouped into two categories Faas and BaaS.

QUESTION 9:

Which of the following is/are challenges in serverless computing ?

a. Functions sharing code

b. Asynchronous calls

c. Adoption of too many technologies

d. All of the above

Correct Answer: d

Detailed Solution: Refer Slide 33.

QUESTION 10:

The focus of cloud computing was _____ and the serverless is _____.

a. programmers, system administrators

b. system administrators, programmers

Correct Answer: b

Detailed Solution: The focus of cloud computing was system administrators and the serverless is programmers.