CUMMINS COLLEGE OF ENGINEERING FOR WOMEN
(An Autonomous Institute affiliated to Savitribai Phule Pune University)
Third Year Computer
CLOUD COMPUTING (PECE3101A)

Duration : 01:00 Hour   Max Marks : 25

Instructions :

1. All questions are compulsory.
2. Please read each question carefully.
3. **SHORT, PRECISE and CONCISE answers are expected.**
4. The ANSWER must be clear, lucid and SPECIFIC TO the QUESTION asked.
5. MAKE SUITABLE ASSUMPTIONS wherever relevant.
6. Draw neat diagrams wherever necessary.
7. Please Manage/Plan your time carefully for All Questions.

Unit-1

Q No 1 a) A) What are the advantages/features of Google AppEngine (GAE)?   (5)
(02 Marks)

B) Consider development of a typical **Online Tours and Travel Management System** a web application. Google AppEngine (GAE) offers many services to help developers develop an application.
Explain the two services of GAE viz. **Image Manipulation** and **Cron Jobsand** justify with example of each, how they can be used in the development of above web application.
 (03 Marks)

Unit-2

Q No 2 a) A) What is Big Data? Explain.   (5)
(02 Marks)

B) Justify with examples, the purpose/importance of **Variety** and **Velocity** with respect to Big Data, in the context of any one of the applications from **Online Shopping/College website**.
(03 Marks)

Unit-3

Q No 3 a) A) In the context of HDFS, explain the concepts of **Data Replication** and **File System Namespace**.   (5)
(02 Marks)

B) Explain ALL the phases of a Map-Reduce system briefly for the **Counting Shapes of different types like triangle, circle and rectangle** example and draw a neat labelled diagram for the same. Give the explanation in terms of input, output and what happens in each phase.
(03 Marks)

Unit-4

Q No 4 a) A) Explain the **Conceptual level** of Cloud Federation Reference Stack.   (5)
(02 Marks)

B) IoT applications typically use cloud in combination at runtime, to make them better.
Illustrate the same in the context of any **IoT-Cloud Computing Application** of your choice.
Explain how cloud will be useful for your chosen application.
(Your answer should be based on discussions of features/requirements of your IoT application AND based on what features, characteristics, advantages of cloud will be beneficial in above scenario.)
(03 Marks)

Unit-5

A) In the context of Data Center, explain the concept of **Server consolidation**. What advantages does it offer? (02 Marks)   (5)

B) Mobile applications typically use cloud in combination at runtime, to make them better.
What is the role/advantage of using cloud in the **Mobile-Cloud Computing** scenarios?
Illustrate the same in the context of any **Mobile based Entertainment Application** like Netflix.
Describe in brief the features of your above example application.
Explain how cloud will be useful for your chosen application.
Your answer should be based on discussions of mobile features, mobile limitations AND based on what features, characteristics, advantages of cloud will be beneficial in above scenario.
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Unit-1

Q No 1 a) A) When do you choose PaaS model over SaaS model? (5) Who uses PaaS?
(02 Marks)

B) Consider development of a typical **Online Banking System** as a web application. Google AppEngine (GAE) offers many services to help developers develop an application.
Explain ANY TWO services of GAE and justify with example of each, how they can be used in the development of above web application.
(03 Marks)

Unit-2

Q No 2 a) A) What is Big Data? Explain. (5)
(02 Marks)

B) Justify with examples, the purpose/importance of **Variety** and **Velocity** with respect to Big Data, in the context of any one of the applications from **Online Shopping/College website**.
(03 Marks)

Unit-3

Q No 3 a) A) Explain ANY TWO characteristics/features of HDFS (5)
(02 Marks)

B) Explain ALL the phases of a Map-Reduce system briefly for a **Word Count** example and draw a neat labelled diagram for the same. Give the explanation in terms of input, output and what happens in each phase.
(03 Marks)

Unit-4

Q No 4 a) A) Explain the **Conceptual level** of Cloud Federation Reference Stack. (5)
(02 Marks)

B) IoT applications typically use cloud in combination at runtime, to make them better.
Illustrate the same in the context of any **IoT-Cloud Computing Application** of your choice.
Explain how cloud will be useful for your chosen application.
(Your answer should be based on discussions of features/requirements of your IoT application AND based on what features, characteristics, advantages of cloud will be beneficial in above scenario.)
(03 Marks)

Unit-5

A) In the context of Data Center, explain the concept of **Server consolidation**. What advantages does it offer? (02 Marks)

B) Mobile applications typically use cloud in combination at runtime, to make them better.
What is the role/advantage of using cloud in the **Mobile-Cloud Computing** scenarios?
Illustrate the same in the context of any **Mobile based Entertainment Application** like Netflix.
Describe in brief the features of your above example application.
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Unit-1

Q No 1 a) A) What is the difference between PaaS and IaaS? (02 Marks)   (5)

B) Consider development of a typical **Online Shopping System** as a web application. Google AppEngine (GAE) offers many services to help developers develop an application.
Explain the two services of GAE viz. **Url Fetch** and **Account Management** and justify with example of each, how they can be used in the development of above web application.
(03 Marks)

Unit-2

^{Q No 2 a)} A) What are the characteristics of Big Data? (5)
(02 Marks)

B) Justify with examples, the purpose/importance of **Volume** and **Veracity** with respect to Big Data, in the context of any one of the applications from **Online Banking/Social networking**.
(03 Marks)

Unit-3

^{Q No 3 a)} A) Draw a neat labelled Architecture Diagram for Hadoop Distributed File System (HDFS). (5)
(02 Marks)

B) Explain ALL the phases of a Map-Reduce system briefly with a suitable example of your choice and draw a neat labelled diagram for the same. Give the explanation in terms of input, output and what happens in each phase.
(03 Marks)

Unit-4

^{Q No 4 a)} A) Explain the **Conceptual level** of Cloud Federation Reference Stack. (5)
(02 Marks)

B) IoT applications typically use cloud in combination at runtime, to make them better.
Illustrate the same in the context of any **IoT-Cloud Computing Application** of your choice.
Explain how cloud will be useful for your chosen application.
(Your answer should be based on discussions of features/requirements of your IoT application AND based on what features, characteristics, advantages of cloud will be beneficial in above scenario.)
(03 Marks)

Unit-5

Q No 5 a) A) In the context of Data Center, explain the concept of (5)
Server consolidation. What advantages does it offer?
(02 Marks)

B) Mobile applications typically use cloud in combination
at runtime, to make them better.
What is the role/advantage of using cloud in the
Mobile-Cloud Computing scenarios?
Illustrate the same in the context of any **Mobile based
Entertainment Application** like Netflix.
Describe in brief the features of your above example
application.
Explain how cloud will be useful for your chosen
application.
Your answer should be based on discussions of mobile
features, mobile limitations AND based on what features,
characteristics, advantages of cloud will be beneficial in
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<div align="center">Unit-1</div>

Q No 1 a) A) In the context of Google AppEngine (GAE), explain the $^{(5)}$ concept of **Sandboxing**.
(02 Marks)

B) Consider development of a typical **Online Event Management System** of the College as a web application. **Google AppEngine (GAE) offers many services to help developers develop an application.**
Explain the two services of GAE viz. **Image Manipulation** and **Mail** and justify with example of each, how they can be used in the development of above web application.
 (03 Marks)

<div align="center">Unit-2</div>

Q No 2 a) A) Explain the concept of **Visualization** with respect to Big Data. (5)
What different techniques can be used to visualize Big Data?
 (02 Marks)

B) Justify with examples, the purpose/importance of **Variety** and **Value** with respect to Big Data, in the context of any one of the applications from Online learning/Online Shopping.
(03 Marks)

Unit-3

Q No 3 a) A) Explain ANY TWO characteristics/features of HDFS (5)
(02 Marks)

B) Explain ALL the phases of a Map-Reduce system briefly for a **Word Count** example and draw a neat labelled diagram for the same. Give the explanation in terms of input, output and what happens in each phase.
(03 Marks)

Unit-4

Q No 4 a) A) Explain the **Logical and Operational level** of Cloud Federation Reference Stack. (5)
(02 Marks)

B) IoT applications typically use cloud in combination at runtime, to make them better.
Illustrate the same in the context of any Smart Home Application.
Explain how cloud will be useful for your chosen application.
(Your answer should be based on discussions of features/requirements of your IoT application AND based on what features, characteristics, advantages of cloud will be beneficial in above scenario.)
(03 Marks)

Unit-5

Q No 5 a) A) Enlist any four components of a typical Data Center along ⁽⁵⁾ with the purpose of each. (Hint: components like cooling, networking etc.
(02 Marks)

B) Mobile applications typically use cloud in combination at runtime, to make them better.
What is the role/advantage of using cloud in the **Mobile-Cloud Computing** scenarios?
Illustrate the same in the context of any **Mobile Learning Application**.
Describe in brief the features of your above example application.
Explain how cloud will be useful for your chosen application.
Your answer should be based on discussions of mobile features, mobile limitations AND based on what features, characteristics, advantages of cloud will be beneficial in above scenario.
(03 Marks)

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Unit-1

Q No 1 a)   A) In the context of PaaS, what is the use of **services**   (5)
and **APIs**?
When do you choose PaaS model over IaaS model?
(02 Marks)

B) Consider development of a typical **Online Training and Placement System** of the College as a web application. Google AppEngine (GAE) offers many services to help developers develop an application.
Explain the two services of GAE viz. **Task Queues** and **Account Management** and justify with example of each, how they can be used in the development of above web application.
(03 Marks)

Unit-2

Q No 2 a) A) Explain the concept of **Visualization** with respect to Big Data.
What different techniques can be used to visualize Big Data?
 (02 Marks)

(5)

B) Justify with examples, the purpose/importance of **Variety** and **Value** with respect to Big Data, in the context of any one of the applications from Online learning/Online Shopping.
(03 Marks)

Unit-3

Q No 3 a) A) Explain ANY TWO characteristics/features of HDFS
(02 Marks)

(5)

B) Explain ALL the phases of a Map-Reduce system briefly for a **Word Count** example and draw a neat labelled diagram for the same. Give the explanation in terms of input, output and what happens in each phase.
(03 Marks)

Unit-4

Q No 4 a) A) Explain the various **Functional requirements** that cloud service providers have in participating/collaborating in Federated cloud.
(Hint: Functional requirements like low latency)
 (02 Marks)

(5)

B) Explain ANY ONE of the applications from **Healthcare domain** which is based on the combination of IoT and Cloud. Explain how this application works using the features of cloud.
(03 Marks)

Unit-5

Q No 5 a) A) Explain the role of Virtualization in the context of Data (5)
Centers.
(02 Marks)

B) Mobile applications typically use cloud in combination
at runtime, to make them better.
What is the role/advantage of using cloud in the
Mobile-Cloud Computing scenarios?
 Illustrate the same in the context of any **Mobile Gaming
Application**.
Describe in brief the features of your above example
application.
Explain how cloud will be useful for your chosen
application.
Your answer should be based on discussions of mobile
features, mobile limitations AND based on what features,
characteristics, advantages of cloud will be beneficial in
above scenario.
(03 Marks)

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Unit-1

Q No 1 a) A) In the context of Google AppEngine (GAE), explain the (5) concept of **Sandboxing**.
(02 Marks)

B) Consider development of a typical **Online Event Management System** of the College as a web application. **Google AppEngine (GAE) offers many services to help developers develop an application.**
Explain the two services of GAE viz. **Image Manipulation** and **Mail** and justify with example of each, how they can be used in the development of above web application.
 (03 Marks)

Unit-2

Q No 2 a) A) What are the typical sources of Big Data? What kind of variety of data do we see in Big Data? (02 Marks) (5)

B) Justify with examples, the purpose/importance of **Volume** and **Visualization** with respect to Big Data, in the context of any one of the applications from **Online entertainment like NetFlix/Travel website.** (03 Marks)

Unit-3

Q No 3 a) A) Explain the roles of **Name Node** and **Data Nodes** in HDFS. (02 Marks) (5)

B) Explain ALL the phases of a Map-Reduce system briefly for the **Counting Storage media items of different types like DVD, CD and Blu-ray** example and draw a neat labelled diagram for the same. Give the explanation in terms of input, output and what happens in each phase.

(03 Marks)

Unit-4

Q No 4 a) A) Explain the various **Functional requirements** that cloud service providers have in participating/collaborating in Federated cloud. (Hint: Functional requirements like low latency) (02 Marks) (5)

B) Explain ANY ONE of the applications from **Healthcare domain** which is based on the combination of IoT and Cloud. Explain how this application works using the features of cloud. (03 Marks)

Unit-5

A) In the context of Data Center, explain the concept of **Server consolidation**. What advantages does it offer? (02 Marks)

(5)

B) Mobile applications typically use cloud in combination at runtime, to make them better.
What is the role/advantage of using cloud in the **Mobile-Cloud Computing** scenarios?
Illustrate the same in the context of any **Mobile based Entertainment Application** like Netflix.
Describe in brief the features of your above example application.
Explain how cloud will be useful for your chosen application.
Your answer should be based on discussions of mobile features, mobile limitations AND based on what features, characteristics, advantages of cloud will be beneficial in above scenario.
(03 Marks)

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6. Draw neat diagrams wherever necessary.
7. Please Manage/Plan your time carefully for All Questions.
8. The answers should be in your OWN WORDS.

Unit-1

Q No 1 a) A) Explain the concept of **cloud bursting/dynamic provisioning**.   (5)
(02 Marks)

B) Compare public cloud and hybrid cloud on any two factors.

Also give the type of applications / use cases for each of the above cloud.
(03 Marks)

Unit-2

Q No 2 a) Give any one good example of a Cloud application/use in (4) **Healthcare domain**.
Describe in brief the features of your example application. Why would you choose Cloud (IaaS, PaaS, SaaS or any other services, offered by cloud) for developing/deploying this application?
In detail, explain how Cloud will be useful for your chosen application.
Your answer should be based on discussions of what features, characteristics, advantages of cloud will be beneficial in above scenario.

Unit-3

Q No 3 a) A) Explain how students can benefit from Amazon Elastic (11) Compute Cloud (EC2) service of AWS.
(02 Marks)

B) Compare and contrast Container (or Docker) based systems and Hypervisor (or VM) based virtualization systems.
(03 Marks)

C) Key-Value store is a type of NoSQL database. What are the advantages of Key-Value data store?
For user information in user profile, show with example how Key-Value store can be applied.
(03 Marks)

D) Give any three limitations of relational databases as compared to NoSQL databases.
(03 Marks)

Unit-4

A) What are the concepts and technologies relevant for (15)
Mashups?
How are Mashups useful/beneficial in designing
applications/websites?
(03 Marks)

B)In a banking system, people can apply for loans, check their
loan status, make payment for loan installments, using
mobile/web application clients. Clients connect to back-end
banking applications residing on servers in data centres.
Why should you choose to use web services/SOA to
implement the above application?
What benefits will you get by using web services/SOA?
Give examples of any two web services in the above context
and their description in brief.
(04 Marks)

C) In the context of web services, explain why one needs to
describe services and also explain the role/need of
directory/registry service. (Hint: UDDI, ...)
(04 Marks)

D) Compare and Contrast **Traditional packaged software** and
SaaS.
(04 Marks)

Unit-5

A) Explain why security is important when you run Government applications on cloud? (15)
(03 Marks)

B)What is the difference between **Authentication** and **Authorization**?
How do **Authentication** and **Authorization** help secure the cloud systems better?
Illustrate with examples.
(04 Marks)

C) How is security (threats/solutions) different for a virtualized environment?
Explain ANY TWO vulnerabilities related to virtualized environment.
(04 Marks)

D) Explain with examples, how do following threats/attacks work.
i) Password guessing
ii) Trojan Horses and Malware
(04 Marks)

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6. Draw neat diagrams wherever necessary.

Unit-1

Q No 1 a) A) Explain in brief, the following essential characteristics of cloud as per NIST definition.   (9)
      i) On Demand Self-Service   ii) Broad Network Access
(2 Marks)
Compare public cloud and private cloud on the following factors / aspects.
  i) Cost   ii) Security
iii) the type of applications / use cases, these clouds will be used for respectively.
(3 Marks)
B)Mobile applications typically use cloud in combination at runtime, to make them better.
    What is the role/advantage of using cloud in the "Mobile-Cloud Computing" scenarios?
Illustrate the same in the context of any "Mobile based Entertainment Application" like NetFlix.
Describe in brief the features of your above example application.
In detail, explain how cloud will be useful for your chosen application.
Your answer should be based on discussions of mobile features,
mobile limitations AND based on what features, characteristics, advantages of cloud will be beneficial in above scenario. **(4 Marks)**

Unit-2

Q No 2 a) A) Explain the need for Amazon Elastic Compute Cloud (EC2) service of AWS.   (2 Marks)   (11)
Compare and contrast Container (or Docker) based systems and Hypervisor (or VM) based virtualization systems.   (3 Marks)

B) Draw a neat labelled Architecture Diagram for Hadoop Distributed File System (HDFS).
 What is the role of "Name Node" in HDFS? (3 Marks)
 Give any three advantages of NoSQL databases over relational databases.   (3 Marks)

Unit-3

Q No 3 a) A) In the context of web services, write on the concept, need and use of Web Service Description Language (WSDL).   (15)
(3Marks)
 With an example, illustrate format of a SOAP message in "Simple Object Access Protocol (SOAP)" protocol.
What are the different elements of the message, that need to be specified?
(Hint: message body, XML request etc.) (4 Marks)

 B) In the context of SaaS/web services, explain the following concepts.
 i) Multi-tenancy   ii) Mashups   (4 Marks)
Compare REpresentational State Transfer (REST) protocol and
Simple Object Access Protocol (SOAP) for ease, performance, security and other relevant aspects. (4 Marks)

Unit-4

Q No 4 a) A) Comment on the security, privacy, and data confidentiality in public clouds. (3 Marks)   (15)
Explain with examples, how do following threats/attacks work.

 i) Dumpster diving   ii) Trojan Horses and Malware   (4 Marks)
B) Explain the following types of security attacks.
 i) Network Intrusion   ii) Session Hijacking
 (4 Marks)
Explain with examples, how do following security mechanisms work.
 i) Biometrics   ii) Passwords
 (4 Marks)

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Third_Year Computer

CLOUD COMPUTING (PECE3101A)

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6. Draw neat diagrams wherever necessary.

Unit-1

Q No 1 a) A) Explain in brief, any two essential characteristics of   (9)
cloud as per NIST definition. **(2 Marks)**
A company can buy/build its own Data Center by
purchasing computers. Company can also opt to use the
Cloud and Rent the computers / Infrastructure.
Compare and contrast the above two options (of
Buy/build Vs Rent) based on various points. **(3 Marks)**

B) Give any one good example of a Cloud
application/use in "Banking domain"
Describe in brief the features of your example application.
Why would you choose Cloud (IaaS, PaaS, SaaS or any other
services, offered by cloud) for developing/deploying this
application?
In detail, explain how Cloud will be useful for your chosen
application.
Your answer should be based on discussions of what
features, characteristics, advantages of cloud will be
beneficial in above scenario.   **(4 Marks)**

Unit-2

Q No 2 a) A) Why do we virtualize? (2 Marks)

Compare two storage types of AWS, viz. Elastic Block Store (EBS) and S3.
(3 Marks)

B) What are the typical sources of Big Data?

What kind of variety of data do we see in Big Data? Give examples of the same. (3 Marks)
Compare Relational Database Management Systems (RDBMS) and NoSQL on various aspects. (3 Marks)

Unit-3

Q No 3 a) A) What are web services?

Describe the sequence of steps involved in publishing and accessing a web service. (Hint: steps like register etc.)
(3 Marks)

Write on Salesforce as a case study of Software as a Service (SaaS).
Explain in brief, how use of it, will benefit in any one of the industries from manufacturing OR education. (4 Marks)

B) Explain the following concepts.

i) Mashups   ii) UDDI   (4 Marks)

Compare REpresentational State Transfer (REST) protocol and Simple Object Access Protocol (SOAP) on various aspects. (4 Marks)

Unit-4

Q No 4 a) **A)** In the context of Cloud Security, explain the concepts of (15) "Confidentiality", "Integrity" and "Availability". (3 Marks)

In the context of Identity Management, how do "Authentication" and
"Access Control" help secure the cloud systems better? Illustrate with examples. (4 Marks)

B) Explain the following concepts /terms.

  i) Mandatory Access Control   ii) Network Intrusion attack
  (4 Marks)

Explain with examples, how do following threats/attacks work.
  i) Social Engineering   ii) Dumpster diving
  (4 Marks)

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6. Draw neat diagrams wherever necessary.

Unit-1

Q No 1 a) A) In the context of hybrid cloud, explain the concept of "cloud bursting/ dynamic provisioning". **(2 Marks)**   (9)

Compare public cloud and private cloud on the following factors / aspects.
   i) Security   ii) Performance
   iii) the type of applications / use cases, these clouds will be used for respectively.
   (3 Marks)

B) Mobile applications typically use cloud in combination at runtime, to make them better.
What is the role/advantage of using cloud in the "Mobile-Cloud Computing" scenarios?
Illustrate the same in the context of "Mobile Gaming Application".
Describe in brief the features of your above example application.
In detail, explain how cloud will be useful for your chosen application.
Your answer should be based on discussions of mobile features, mobile limitations AND based on what features, characteristics, advantages of cloud will be beneficial in above scenario. **(4 Marks)**

Unit-2

Q No 2 a) A) Explain the need for Amazon Elastic Compute Cloud (EC2) service of AWS.   (2 Marks)   (11)
Compare and contrast Container (or Docker) based systems and Hypervisor (or VM) based virtualization systems.   (3 Marks)

B) Draw a neat labelled Architecture Diagram for Hadoop Distributed File System (HDFS).
What is the role of "Name Node" in HDFS? (3 Marks)
Give any three advantages of NoSQL databases over relational databases.   (3 Marks)

Unit-3

Q No 3 a) A) In the context of web services, write on the concept, need and use of Web Service Description Language (WSDL).   (15)
(3Marks)
With an example, illustrate format of a SOAP message in "Simple Object Access Protocol (SOAP)" protocol.
What are the different elements of the message, that need to be specified?
(Hint: message body, XML request etc.) (4 Marks)

B) In the context of SaaS/web services, explain the following concepts.
i) Multi-tenancy   ii) Mashups   (4 Marks)
Compare REpresentational State Transfer (REST) protocol and
Simple Object Access Protocol (SOAP) for ease, performance, security and other relevant aspects. (4 Marks)

Unit-4

Q No 4 a) A) In the context of Cloud Security, explain the concepts of "Confidentiality", "Integrity" and "Availability". (3 Marks)   (15)

In the context of Identity Management, how do "Authentication" and
"Access Control" help secure the cloud systems better? Illustrate with examples.   (4 Marks)

B) Explain the following concepts /terms.
   i) Mandatory Access Control   ii) Network Intrusion attack
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Explain with examples, how do following threats/attacks work.
   i) Social Engineering   ii) Dumpster diving
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Unit-1

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       i) On Demand Self-Service   ii) Broad Network Access
   (2 Marks)
   Compare public cloud and private cloud on the following factors / aspects.
     i) Cost   ii) Security
   iii) the type of applications / use cases, these clouds will be used for respectively.
   (3 Marks)
B)Mobile applications typically use cloud in combination at runtime, to make them better.
      What is the role/advantage of using cloud in the "Mobile-Cloud Computing" scenarios?
   Illustrate the same in the context of any "Mobile based Entertainment Application" like NetFlix.
   Describe in brief the features of your above example application.
   In detail, explain how cloud will be useful for your chosen application.
   Your answer should be based on discussions of mobile features,
   mobile limitations AND based on what features, characteristics, advantages of cloud will be beneficial in above scenario. **(4**
Marks)

Unit-2

Q No 2 a) A) Why containers are called "lightweight"? Justify. (2 Marks)   (11)
   Compare and Contrast "Physical Servers" and "Virtual Machines".
   (3 Marks)

   B) What are NoSQL databases? Explain in brief ANY TWO types of NoSQL databases.(3 Marks)
   Compare the roles of Map phase and Reduce phase, with a suitable example of your choice and draw a neat labelled
   diagram for the same. (3 Marks)

Unit-3

Q No 3 a) A) In the context of web services, write on the concept, need and use of Web Service Description Language (WSDL).   (15)
   (3Marks)
    With an example, illustrate format of a SOAP message in "Simple Object Access Protocol (SOAP)" protocol.
   What are the different elements of the message, that need to be specified?
   (Hint: message body, XML request etc.) (4 Marks)

    B) In the context of SaaS/web services, explain the following concepts.
    i) Multi-tenancy   ii) Mashups   (4 Marks)
   Compare REpresentational State Transfer (REST) protocol and
   Simple Object Access Protocol (SOAP) for ease, performance, security and other relevant aspects. (4 Marks)

Unit-4

Q No 4 a) A) Comment on the security, privacy, and data confidentiality in public clouds. (3 Marks)   (15)
   Explain with examples, how do following threats/attacks work.

    i) Dumpster diving   ii) Trojan Horses and Malware   (4 Marks)
   B) Explain the following types of security attacks.
    i) Network Intrusion   ii) Session Hijacking
     (4 Marks)
   Explain with examples, how do following security mechanisms work.
   i) Biometrics   ii) Passwords
     (4 Marks)

CUMMINS COLLEGE OF ENGINEERING FOR WOMEN

(An Autonomous Institute affiliated to Savitribai Phule Pune University)

Third_Year Computer

CLOUD COMPUTING (PECE3101A)

Duration : 02:00 Hours   Max Marks : 50

Instructions :

1. All questions are compulsory.
2. Please read each question carefully.
3. SHORT, PRECISE and CONCISE answers are expected.
4. The ANSWER must be clear, lucid and SPECIFIC TO the QUESTION asked.
5. MAKE SUITABLE ASSUMPTIONS wherever relevant.
6. Draw neat diagrams wherever necessary.

Unit-1

Q No 1 a) A) What are the responsibilities of customer and cloud service provider in Infrastructure as a Service (IaaS)? (9)

(Hint: responsibilities like developing applications and maintaining- Infrastructure etc.)
(2 Marks)

A college can buy/build its own Data Center by purchasing computers.
College can also opt to use the Cloud and Rent the computers / Infrastructure.
Compare and contrast the above two options (of Buy/build Vs Rent) based on various points. **(3 Marks)**

Give any one good example of a Cloud application/use in "Online Shopping domain like Amazon".
Describe in brief the features of your example application.
Why would you choose Cloud (IaaS, PaaS, SaaS or any other services, offered by cloud) for developing/deploying this application?
In detail, explain how Cloud will be useful for your chosen application.
Your answer should be based on discussions of what features, characteristics, advantages of cloud will be beneficial in above scenario.   **(4 Marks)**

Unit-2

Q No 2 a) A) Which of Type I and Type II hypervisors are more suitable for data centers and for personal laptops respectively? (2 Marks) (11)
Compare and Contrast Full virtualization and Para-virtualization.(3 Marks)

B) Explain the various features of NoSQL databases. (3 Marks)
Compare Relational Database Management Systems (RDBMS) and HBase on various aspects. (3 Marks)

Unit-3

Q No 3 a) A) What are REST based web services? What advantages they ⁽¹⁵⁾ offer? (3 Marks)
 Write on Salesforce as a case study of Software as a Service (SaaS). Explain in brief, how use of it, will benefit in any one of the industries from banking OR automobile. (4 Marks)

B) What is SOA? Explain the various features/characteristics/benefits of SOA.   (4 Marks)
 What is a difference between SaaS, PaaS and IaaS, in terms of features offered, advantages, users and use cases?
(4 Marks)

Unit-4

Q No 4 a) A) Explain why security is important when you run shopping ⁽¹⁵⁾ applications on cloud? (3 Marks)
How do "Authentication" and "Authorization" help secure the cloud systems better? Illustrate with examples.
(4 Marks)

B) Explain the following vulnerabilities related to virtualized environment.
 i) Keystroke logging   ii) VM Monitoring from the Host
   (4 Marks)
Explain with examples, how do following threats/attacks work.
  i) Password guessing   ii) Trojan Horses and Malware
     (4 Marks)

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<div align="center">Unit-1</div>

Q No 1 a) A) Explain in brief, any two essential characteristics of cloud as per NIST definition. **(2 Marks)**   (9)
A company can buy/build its own Data Center by purchasing computers. Company can also opt to use the Cloud and Rent the computers / Infrastructure.
Compare and contrast the above two options (of Buy/build Vs Rent) based on various points. **(3 Marks)**

B) Give any one good example of a Cloud application/use in "Banking domain"
Describe in brief the features of your example application.
Why would you choose Cloud (IaaS, PaaS, SaaS or any other services, offered by cloud) for developing/deploying this application?
In detail, explain how Cloud will be useful for your chosen application.
Your answer should be based on discussions of what features, characteristics, advantages of cloud will be beneficial in above scenario.   **(4 Marks)**

<div align="center">Unit-2</div>

Q No 2 a) A) Explain any two advantages of virtualization. (2 Marks)   (11)

Compare and contrast Type I Hypervisor based virtualization and Type II Hypervisor based virtualization. (3 Marks)

B) In the context of HDFS, explain the concept of "Heartbeat".
How it is useful and what information it carries? (3 Marks)

Compare NoSQL column-oriented databases with row-oriented relational databases.(3 Marks)

Unit-3

Q No 3 a) A) What are web services?   (15)

Describe the sequence of steps involved in publishing and accessing a web service. (Hint: steps like register etc.)
(3 Marks)

Write on Salesforce as a case study of Software as a Service (SaaS).
Explain in brief, how use of it, will benefit in any one of the industries from manufacturing OR education. (4 Marks)

B) Explain the following concepts.

i) Mashups   ii) UDDI   (4 Marks)

 Compare REpresentational State Transfer (REST) protocol and   Simple Object Access Protocol (SOAP) on various aspects. (4 Marks)

Unit-4

A) Comment on the security, privacy, and data (15)
confidentiality in public clouds. (3 Marks)
Explain with examples, how do following threats/attacks
work.

   i) Dumpster diving   ii) Trojan Horses and
Malware   (4 Marks)
B) Explain the following types of security attacks.

  i) Network Intrusion   ii) Session Hijacking
  (4 Marks)
Explain with examples, how do following security
mechanisms work.
 i) Biometrics   ii) Passwords
  (4 Marks)

Third_Year Computer

CLOUD COMPUTING (PECE3101A)

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Unit-1

Q No 1 a) A) In the context of hybrid cloud, explain the concept of "cloud [(9)] bursting/ dynamic provisioning". **(2 Marks)**

Compare public cloud and private cloud on the following factors / aspects.
   i) Security   ii) Performance
   iii) the type of applications / use cases, these clouds will be used for respectively.
   (3 Marks)

B) Mobile applications typically use cloud in combination at runtime, to make them better.
What is the role/advantage of using cloud in the "Mobile-Cloud Computing" scenarios?
Illustrate the same in the context of "Mobile Gaming Application".
Describe in brief the features of your above example application.
In detail, explain how cloud will be useful for your chosen application.
Your answer should be based on discussions of mobile features, mobile limitations AND based on what features, characteristics, advantages of cloud will be beneficial in above scenario. **(4 Marks)**

Unit-2

Q No 2 a) A) Why containers are called "lightweight"? Justify. [(11)]
(2 Marks)
Compare and Contrast "Physical Servers" and "Virtual Machines".
(3 Marks)

B) What are NoSQL databases? Explain in brief ANY TWO types of NoSQL databases.(3 Marks)
Compare the roles of Map phase and Reduce phase, with a suitable example of your choice and draw a neat labelled diagram for the same. (3 Marks)

Unit-3

Q No 3 a) A) What is Software as a Service (SaaS)? How is (15)
multi-tenancy advantageous in SaaS systems? (3 Marks)

Give example of any one web service in any application of your choice. In the context of web services, illustrate the concept of "Universal Description, Discovery and Integration (UDDI)" registry and its use. (4 Marks)

B) Draw "Web Services Architecture diagram" showing the various technologies involved in accessing the web service.
In the context of web services, explain the roles of SOAP and WSDL.
(4 Marks)
Write on the characteristics/advantages of SaaS over traditional software.
(4 Marks)

Unit-4

Q No 4 a) A) In the context of Cloud Security, explain the concepts of (15) "Confidentiality", "Integrity" and "Availability". (3 Marks)

In the context of Identity Management, how do "Authentication" and
"Access Control" help secure the cloud systems better? Illustrate with examples. (4 Marks)

B) Explain the following concepts /terms.

i) Mandatory Access Control   ii) Network Intrusion attack
(4 Marks)

Explain with examples, how do following threats/attacks work.
i) Social Engineering   ii) Dumpster diving
(4 Marks)

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B) Give any one good example of a Cloud application/use in "Banking domain"
Describe in brief the features of your example application. Why would you choose Cloud (IaaS, PaaS, SaaS or any other services, offered by cloud) for developing/deploying this application?
In detail, explain how Cloud will be useful for your chosen application.
Your answer should be based on discussions of what features, characteristics, advantages of cloud will be beneficial in above scenario.   **(4 Marks)**

Unit-2

Q No 2 a) A) Which of Type I and Type II hypervisors are more (11)
suitable for data centers and for personal laptops
respectively? (2 Marks)
Compare and Contrast Full virtualization and
Para-virtualization.(3 Marks)

B) Explain the various features of NoSQL databases. (3
Marks)
Compare Relational Database Management Systems
(RDBMS) and HBase on various aspects. (3 Marks)

Unit-3

Q No 3 a) A) What are web services? (15)

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etc.)
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Write on Salesforce as a case study of Software as a
Service (SaaS).
Explain in brief, how use of it, will benefit in any one of
the industries from manufacturing OR education. (4
Marks)

B) Explain the following concepts.

i) Mashups   ii) UDDI   (4 Marks)

 Compare REpresentational State Transfer (REST)
protocol and   Simple Object Access Protocol (SOAP) on
various aspects. (4 Marks)

Unit-4

A) Comment on the security, privacy, and data   (15)
confidentiality in public clouds. (3 Marks)
Explain with examples, how do following threats/attacks
work.

   i) Dumpster diving   ii) Trojan Horses and
Malware   (4 Marks)
B) Explain the following types of security attacks.

  i) Network Intrusion   ii) Session Hijacking
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In detail, explain how Cloud will be useful for your chosen application.
Your answer should be based on discussions of what features, characteristics, advantages of cloud will be beneficial in above scenario.   **(4 Marks)**

Unit-2

Q No 2 a) A) Why do we virtualize? (2 Marks)   (11)

Compare two storage types of AWS, viz. Elastic Block
Store (EBS) and S3.
(3 Marks)

B) What are the typical sources of Big Data?

What kind of variety of data do we see in Big Data?
Give examples of the same. (3 Marks)
Compare Relational Database Management Systems
(RDBMS) and NoSQL on various aspects.   (3 Marks)

Unit-3

Q No 3 a) A) What are   (15)
Mashups?

How are Mashups useful/beneficial in designing websites?
(3 Marks)

In a banking system, one can typically check balance,
withdraw money through ATM, perform various
transactions on savings account etc. ATMs connect to
back-end banking applications residing on servers in data
centers.
Why should you choose to use web services/SOA to
implement the above application?
What benefits will you get by using web services/SOA?
Give examples of any two web services in the above
context and their description in brief. (4 Marks)

B) In the context of web services, explain the concepts
and roles of UDDI and WSDL. (4 Marks)

Compare and Contrast "Traditional packaged software" and
"SaaS". (4 Marks)

Unit-4

Q No 4 a) A) Explain why security is important when you run shopping   (15)
applications on cloud? (3 Marks)
How do "Authentication" and "Authorization" help secure
the cloud systems better? Illustrate with examples.
(4 Marks)

B) Explain the following vulnerabilities related to
virtualized environment.
 i) Keystroke logging   ii) VM Monitoring from the
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Unit-1

A) What are the risks involved in the use of Cloud paradigm? **(2 Marks)**

Explain with examples, how cloud services IaaS and PaaS respectively, can be advantageous to Startups/businesses. **(3 Marks)**

B) Mobile applications typically use cloud in combination at runtime, to make them better.
What is the role/advantage of using cloud in the "Mobile-Cloud Computing" scenarios?
Illustrate the same in the context of "Mobile Learning Application".
Describe in brief the features of your above example application.
In detail, explain how cloud will be useful for your chosen application.
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