MCA IV SEMESTER MCA 401A: Cloud Computing

UNIT I

Cloud Architecture and Model:Technologies for Network-Based System – System Models for Distributed and Cloud Computing – NIST Cloud Computing Reference Architecture, Cloud Models: Characteristics – Cloud Services – Cloud models (IaaS, PaaS, SaaS) – Public Vs Private Cloud –Cloud Solutions - Cloud ecosystem – Service management – Computing on demand.

UNIT II

Virtualization: Basics of Virtualization - Types of Virtualization - Implementation Levels of Virtualization - Virtualization Structures - Tools and Mechanisms - Virtualization of CPU, Memory, I/O Devices - Virtual Clusters and Resource management – Virtualization for Data-center Automation. VMWare, Virtual Box Virtualization software.

UNIT III

Cloud Infrastructure:Architectural Design of Compute and Storage Clouds – Layered Cloud Architecture Development – Design Challenges - Inter Cloud Resource Management – Resource Provisioning and Platform Deployment – Global Exchange of Cloud Resources. Federation in the Cloud – Four Levels of Federation – Federated Services and Applications – Future of Federation

Programming Model: Parallel and Distributed Programming Paradigms – MapReduce, Twister and Iterative MapReduce – Hadoop Library from Apache – Mapping Applications - Programming Support – Software environments for service development; Amazon, Azure, GoogleApp Engine, AWS - Cloud Environments - Eucalyptus, Open Nebula, OpenStack, Aneka, CloudSim. Cloud Storage – Storage-as-a-Service – Advantages of Cloud Storage – Cloud Storage Providers – S3.

UNIT V

Security In The Cloud : Security Overview – Cloud Security Challenges and Risks – Software-as-a-Service Security – Security Governance – Risk Management – Security Monitoring – Security Architecture Design – Data Security – Application Security – Virtual Machine Security - Identity Management and Access Control.

Text Books:

1. Kai Hwang, Geoffrey C Fox, Jack G Dongarra, "Distributed and Cloud Computing, From Parallel Processing to the Internet of Things", Morgan Kaufmann Publishers, 2012.

2. Rittinghouse, John W., and James F. Ransome, —Cloud Computing: Implementation, Management and Securityl, CRC Press, 2017.

Reference Books

- 1. John W.Rittinghouse and James F.Ransome, "Cloud Computing: Implementation, Management, and Security", CRC Press, 2010.
- 2. Kumar Saurabh, "Cloud Computing insights into New-Era Infrastructure", Wiley India, 2011.

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MASTER OF COMPUTER APPLICATIONS DEGREE EXAMINATION — FEBRUARY 2021. FIFTH SEMESTER

MCA - 502: CLOUD COMPUTING

(Under C.B.C.S Revised New Regulations w.e.f. 2016-2017)

(Common Paper to University and all Affiliated Colleges)

(Regular/ Supplementary)

Time : 3 hours

Max. Marks : 80

PART – **A** – (Compulsory)

Answer any FIVE of the following Questions. Each Question carries 4 marks

(Marks : $5 \times 4 = 20$)

- 1. (a) State the disadvantages of Distributed Computing that Cloud Computing resolves.
 - (b) Enumerate on the pros and cons of cloud service development.
 - (e) List the tools used for Virtualization.
 - (d) What is the need for Virtualization in Data Center Automation? Explain.
 - (e) State the disadvantages of Global exchange of Cloud Resources.
 - (f) Explain about Data Security.
 - (g) What are the advantages of Aneka?
 - (h) Explain about Parallel Programming Paradigms.
 - (i) What is meant by Identity Management?
 - (j) What is meant by Access Control? Explain.

PART – B

Answer any ONE full question from each Unit. Each Question carries 12 marks.

(Marks : $5 \times 12 = 60$)

UNIT – I

- 2. (a) Write a short note on the necessity of cloud computing.
 - (b) Discuss in detail about the cloud architecture with its merits and demerits.

Or

[P.T.O.]

- 3. (a) List and explain in detail about the various cloud services available with their applications.
 - (b) Elaborate on the terms "Software as a service and platform as a service".

UNIT – II

- 4. (a) Discuss the disadvantages of Virtualization for Data Center Automation.
 - (b) What are the steps involved in the collaboration of event management and contact management? Explain.

Or

- 5. (a) Describe in brief about the advantages of CPU Virtualization.
 - (b) Discuss about I/O Virtualization.

UNIT – III

- 6. (a) Discuss in detail about Platform Deployment.
 - (b) Explain in detail about the Architectural design of compute and storage cloud.

Or

- 7. (a) Explain about the Inter Cloud Resource Management.
 - (b) Discuss in detail the properties of Storage Clouds.

UNIT - IV

- 8. (a) Write a short note on the process of discovering cloud services development and tools.
 - (b) Write a short note on the process of evaluating web mail services in cloud environment.

Or

- 9. (a) How is the process of email communications centralized in a cloud environment? Explain.
 - (b) Enumerate in detail about the Amazon Ec2 and IBM Clouds.

12-00-5-02

UNIT – V

10.	(a)	With an example explain in detail about Autonomic Security.
	(b)	Discuss in detail about Virtual Machine Security.
	÷	Or
11.	(a)	List and explain the different types of Access Control.
	(b)	Explain in detail about Risk Management.

12-00-5-02

MASTER OF COMPUTER APPLICATION DEGREE EXAMINATION — NOVEMBER/DECEMBER 2018

FIFTH SEMESTER

MCA 502 — CLOUD COMPUTING

(Under CBCS Revised New Regulations w.e.f. 2016-2017) (Common Paper to University and all Affiliated Colleges)

Time : 3 hours

Max. Marks: 80

PART - A (Compulsory)

Answer any FIVE of the following.

Each question carries 4 marks.

 $(Marks : 5 \times 4 = 20)$

- 1. (a) List the disadvantages of distributed computing.
 - (b) What is meant by elasticity? Explain it in terms of cloud computing.
 - (c) Name the reasons for the need for virtualization.
 - (d) What are the disadvantages of Virtualization in a Data-center Automation? Discuss how it could be resolved.
 - (e) Why do you need a storage cloud? Discuss.
 - (f) What are the disadvantages if there is a global Exchange of cloud resources? Discuss its implications.
 - (g) Explain the applications of parallel programming.
 - (h) What is MapReduce? Explain.
 - (i) Why is there a need for security in cloud?
 - (j) Explain the disadvantages of providing security on a cloud.

PART - B

Answer any ONE full question from each Unit.

Each question carries 12 marks.

(Marks : $5 \times 12 = 60$)

UNIT – I

- 2. (a) Discuss in detail about the advantages of Cloud over a traditional network.
 - (b) With an example discuss in detail about PaaS.

Or

- 3. (a) List and explain in detail about Cloud Ecosystem.
 - (b) What are the different characteristics of Cloud? Discuss with appropriate examples.

UNIT – II

4. Discuss in detail about the different levels of Virtualization.

Or

5. With an example discuss in detail about Memory Virtualization.

UNIT – III

6. With a diagram explain in detail about the architectural design of compute and storage clouds.

Or

7. What is Resource Provisioning? Explain it in detail.

UNIT - IV

- 8. (a) Discuss in detail about Hadoop Library from Apache.
 - (b) Explain the step by step approach for deploying using Cloud Sim.

Or

- 9. (a) Explain in detail about Eucalyptus.
 - (b) What is the need for Eucalyptus? Discuss it in detail.

UNIT - V

10. What is SaaS? Discuss in detail about the security in SaaS.

Or

11. Discuss in detail about the security in a virtual machine.

12-00-5-02

[Total No. of Pages : 2

9/20

12-00-4-01R

MASTER OF COMPUTER APPLICATIONS DEGREE EXAMINATION, SEPTEMBER/OCTOBER-2024 FOURTH SEMESTER

Paper - MCA 401A : CLOUD COMPUTING

(Under C.B.C.S. New Regulations w.e.f. 2020-2021) (Common paper to University and All Affiliated Colleges)

Time : 3 Hours

Max. Marks: 70

PART-A

(Compulsory)

Answer any FIVE of the followin questions. Each question carries 4 marks.(5×4=20)

- 1. Define distributed computing and cloud computing. How are they different?
 - <u>(h)</u> Define Infrastructure as a Service (laaS) and provide an example.
 - c) Compare and contrast server virtualization and desktop virtualization.
 - d) Explain the different levels at which virtualization can be implemented.
 - e) Mention challenges associated with the global exchange of cloud resources.
 - f) How does automation enhance resource provisioning?
 - <u>, g)</u> Define Storage-as-a-Service and discuss its advantages in the context of cloud computing.
 - h) What are the main components of Hadoop, and how do they interact?
 - What are the key security concerns specific to Software-as-a-service (SaaS) models?

Discuss the importance of data encryption in cloud environments.

PART - B

Answer Five questions, choosing One question from each unit. Each question carries 10 marks. (5×10=50)

UNIT-I

- 2. i) Compare the client-server model with the peer-to-peer model in distributed computing.
 - ii) Explore the concept of computing on demand and its evolution with cloud technologies.

(OR)

- i) Discuss the differences between public, private, and hybrid cloud models.
- ii) Explain how cloud solutions can improve disaster recovery and business continuity.

12-00-4-01R

[P.T.O.]

UNIT - II

- 4. i) Describe the different implementation levels of virtualization, Compare and contrast the advantages and disadvantages of each level.
 - ii) Explain how virtualization technologies are utilized in data-center automation. What are the key benefits and potential drawbacks of this approach?

(OR)

- i) Explain how virtualization contributes to data-center automation and efficiency.
 - Explain how CPU virtualization works and its benefits.

UNIT - III

- i) Describe the architectural design of computing and storage clouds. How do these designs Facilitate scalability and resource optimization?
 - ii) Explain the concept of inter-cloud resource management. What are the benefits and challenges associated with it?

(OR)

- 7. i) Discuss the challenges and best practices in implementing and managing each federation level.
 - ii) Discuss the role of standardization and policy frameworks in the future of cloud federation.

UNIT-IV

- 8. i) Discuss the MapReduce Programming model. Explain how it simplifies the processing of large datasets in a distributed environment.
 - ii) Explain the role of the Hadoop Distributed File System (HDFS) in the Hadoop ecosystem. How does it manage data storage and retrieval?

(OR)

- i) Compare and contrast cloud environments like Eucalyptus, Open Nebula, Open Stack, Aneka, and CloudSim. Highlight their unique features and use cases.
 - ii) Explain the concept of Amazon S3. How does it ensure data durability and availability?

UNIT - V

- **10.** i) List and describe the steps involved in a cloud security risk management process.
 - ii) Explain the principle of least privilege and its importance in cloud security architecture design.

(OR)

- **11.** i) Describe the common security threats to cloud-based applications.
 - ii) Explain the concept of isolation in the context of VM security.

12-00-4-01R

ii)

(2)

UNIT-3

FEB 2021

6 (a) Discurs in dutail about platform Deployment? (b) Enplain in detail about the Aschitectural design of Compute and Storage cland.

Nov Dec 2018

6. vorite a d'agram explain în detail about the architertural design & compute and storage clouds. Supplot 2024

- 6. i) Describe the architectural design of computing and Storage claudo How do these designs Facilitate Scalability and resource optimization 2.
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UNIT-4

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environment ii) Enplain the sole of Hadoop Distributed Filesporen, (HDFS) in the FED 2021

- 7. of Explain about the Intercloud Resource Management b) Discuss in detail the properties of Storage Clouds.
- Nou De 2018 7. What is Resauce Provisioning & Explain it in detail Sytlat 2024
- 7 i) Discuss the challenges and best providies in Implementing and managing early federation Level. (i) Discuss the role of Standardization and Policy frame works
 - in the future A clad federation.

Nov (Dec 2018 9. 9) Explain in detail about Eucalyptus? Discuss it in Detail. 6) what is the need for Eucalyptus? Discuss it in Detail. FED 2021 9. a) How is the Process of Email Communications Cantalized in a Class Environment? Explain. 6) Enumerate in detail about the Amazon Ecz and JDH Clauds. 2011 9. a) Open Netula, open Start, Aneka and Claud Sim. Highlight then Unique Festives and WX Carro.

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