

**MASTER OF COMPUTER APPLICATIONS DEGREE EXAMINATION,
JUNE/JULY-2025**

FOURTH SEMESTER

PAPER - MCA 40IA : 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 following questions. Each question carries 4 marks. (5×4=20)

1. a) What is utility computing?
- b) What are the advantages of OS level virtualization?
- c) List out the various public cloud offerings of PaaS.
- d) Write the formal definition of map Reduce.
- e) What is Resource bundling?
- f) Write a short note on Megastore
- g) Explain about Amazon simple storage service.
- h) What is cloud echo system.
- i) Mention two cloud environments.
- j) Explain in short about VMWare.

PART - B

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

UNIT - I

2. a) What are the key technologies used in cloud architecture to enable network-based systems?
 - b) Explain the Layered architecture for web services and the grids.
- (OR)**
3. a) Explain the NIST Cloud Computing Reference Architecture.
 - b) Describe the roles of Cloud Consumer, Cloud Provider.

UNIT - II

4. a) Explain the process Virtualization at Instruction Set Architecture (ISA) level.
b) Explain in detail about Hypervisor.

(OR)

5. a) Explain the types of Virtualization.
b) What are the Tools and Mechanisms used in virtualization.

UNIT - III

6. a) Explain the layered cloud architecture Development in detail.
b) Explain the concept of Inter Cloud Resource Management.

(OR)

7. a) What are the design challenges in cloud architecture development.
b) What are the four levels of Federation in cloud?

UNIT - IV

8. a) List the attractive features of Hadoop and describe about Hadoop Cluster.
b) Explain the HDFS and Map Reduce architecture in Hadoop.

(OR)

9. a) What is the difference between Twister MapReduce and Iterative MapReduce.
b) Explain the Hadoop library from Apache software.

UNIT - V

10. a) What are the security challengers in cloud computing?
b) How the software provides security as a service security to cloud.

(OR)

11. a) Give Security architecture Design in detail.
b) What is identity Management and Access Control?

[Total No. of Pages : 2]

**MASTER OF COMPUTER APPLICATIONS DEGREE EXAMINATION,
JUNE/JULY-2025**

FOURTH SEMESTER

PAPER - 402C : INTERNET OF THINGS

(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 following questions. Each question carries 4 marks. (5×4=20)

1. (a) Explain the historical evolution of IoT from early concepts to modern applications.
- (b) What are IoT identifiers? How do they help in IoT communication?
- (c) Define Sensor Networks and explain their significance in IoT.
- (d) What are the key differences between passive RFID and active RFID?
- (e) What is IEEE 802.15.4, and how is it used in IoT applications?
- (f) What are the key differences between BLE (Bluetooth Low Energy) and Classic Bluetooth?
- (g) What is data acquisition, and why is it critical in analytics?
- (h) What is Hadoop, and how does it facilitate Big Data processing?
- (i) Describe how IoT wearables improve lifestyle and fitness.
- (j) Explain the concept of IoT-enabled smart grids.

PART - B

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

UNIT - I

2. a) Describe an example of an IoT system in which information and knowledge are inferred from data.
- b) Describe the function of the communication functional block in a IoT system.

(OR)

3. a) Describe an example of IoT service that uses WebSocket-based communication.
- b) Discuss about **REST-based Communication APIs** used in IoT.

UNIT - II

4. a) Discuss the different **types of networking protocols used in WSN**.
b) Compare the **advantages and limitations of RFID and barcode technology**.

(OR)

5. a) How does **Arduino work in IoT applications**? Describe its architecture, programming, and real world implementations.
b) Discuss the **architecture and working of a Raspberry Pi-based smart home automation system**.

UNIT - III

6. a) Explain the **architecture of Zigbee** and its advantages in IoT networks.
b) Describe the architecture of **CoAP** and its relevance in constrained IoT networks.

(OR)

7. a) Compare and contrast **IEEE 802.15.4-based WPAN technologies (Zigbee, BLE, and Z-Wave)** in terms of range, power consumption, and applications.
b) Discuss the role of edge connectivity protocols in IoT.

UNIT - IV

8. a) Explain the **MapReduce programming model** with an example
b) How does Fog computing handle data differently from traditional Cloud computing?

(OR)

9. a) Describe the **workflow of data from IoT devices to Cloud Analytics**, including storage and processing stages.
b) Compare Cloud Analytics with Local Analytics in terms of performance, scalability, and cost.

UNIT - V

10. a) Explain how IoT is transforming **smart city infrastructure**, with case studies.
b) How does IoT enhance **efficiency** in transportation and logistics? Discuss with real-world applications.

(OR)

11. a) Discuss the challenges and solutions in implementing IoT in healthcare.
b) Compare **cloud-based IoT solutions with edge-based IoT solutions** in smart city applications.

**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 following questions. Each question carries 4 marks. (5×4=20)

1. a) Define distributed computing and cloud computing. How are they different?
- b) Define Infrastructure as a Service (IaaS) 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?
- g) 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?
- i) What are the key security concerns specific to Software-as-a-service (SaaS) models?
- j) 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)

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

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)

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

UNIT - III

6. 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)

9. 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.

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

FOURTH SEMESTER

Paper - 402C : INTERNET OF THINGS

(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. a) Define the Internet of Things (IoT) and discuss its characteristics.
- b) What is the role of edge computing in IoT? How does it improve the performance of IoT systems?
- c) Define Sensor Networks. What are the key components of a typical sensor network?
- d) What are the primary functions of a node in a WSN?
- e) What is the primary use case of HART in industrial IoT environments?
- f) What is Bacnet, and in which domains is it predominantly used?
- g) List and briefly explain the five V's of Big Data.
- h) Define data analytics and its significance in deriving insights from data.
- i) How can IoT improve patient monitoring and healthcare delivery?
- j) List two IoT devices used in agriculture and their applications.

PART - B

Answer Five questions, choosing One question from each unit. Each question carries 10 marks.

(5×10=50)

UNIT - I

2. i) Discuss the logical design of an IoT system in detail.
- ii) Compare and Contrast IoT and M2M.

(OR)

3. i) Describe the challenges and opportunities of integrating IoT with other emerging technologies.
- ii) Explain the WSN and Cloud computing and their role in IoT.

UNIT - II

4. i) Discuss the architecture of a typical Wireless Sensor Network. Explain the roles of different nodes and how they are networked to achieve reliable communication and data transmission.
- ii) Describe the role of Arduino IDE in IoT development. Give the features of Arduino board.

(OR)

5. i) Elaborate on the history and evolution of Wireless Sensor Networks. How have they developed over time, and what are some significant milestones in their advancement?
- ii) Discuss the principles of RFID technology. How do RFID tags and readers work together to enable data exchange?

UNIT - III

6. i) What are the key features of CoAP that make it suitable for constrained environments? Illustrate a typical use case of CoAP in an IoT application.
- ii) Explain the Representational State Transfer (REST) protocol and how does RESTful architecture benefits IoT application.

(OR)

7. i) Explain about 6LoWPAN architecture.
- ii) Discuss Z-Wave, Bluetooth Low Energy (BLE) and Modbus role in IoT.

UNIT - IV

8. i) Describe the key benefits of performing data analytics in the cloud.
- ii) Explain the architecture of Hadoop, focusing on HDFS and MapReduce.

(OR)

9. i) Give two examples of industries that heavily rely on data analytics and explain how they benefit from it.
- ii) What is local analytics, and in what scenarios is it most effective?

UNIT - V

10. i) Discuss the components of IoT infrastructure required for a smart city.
- ii) How does IoT enable personalized shopping experiences in retail?

(OR)

11. i) Describe a comprehensive IoT-based home automation system, including key devices and functionalities.
- ii) Discuss the impact of IoT on energy consumption and cost savings in smart buildings.