R3553	Sub. Code
	2MS3C1

M.Voc. DEGREE EXAMINATION, NOVEMBER – 2025

Third Semester

Software Development

PRINCIPLES OF IoT

(CBCS – 2022 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 1 = 10)

Answer **all** the following objective type questions by choosing the correct option.

1. Which of the following is the primary challenge in loT data management requiring efficient processing and analysis of vast amounts of data generated by devices? (CO1, K2)

   (a) Data Storage (b) Data Security

   (c) Data Variety (d) Data Velocity

2. _____ is specifically designed for short-range communication within 10 meters in IoT applications. (CO1, K2)

   (a) IEEE 802.15.4e (b) IEEE 802.11 ah

   (c) IEEE 802.15.4 (d) IEEE 802.11

3. Which of the following IoT deployment model involves deploying IoT devices and infrastructure on-premises, within an organization's own premises? (CO2, K1)

(a) Cloud-based (b) Fog Computing

(c) Edge Computing (d) On-premises

4. _____ in the IoT Reference Model deals with processing and analyzing data from sensors and devices. (CO2, K1)

(a) Perception Layer

(b) Network Layer

(c) Application Layer

(d) Processing Layer

5. _____ IoT board is known for its ease of use, large community support, and versatility in prototyping and development. (CO3, K2)

(a) Raspberry Pi (b) Arduino

(c) ESP32 (d) Intel Edison

6. Exchanging and storing sensor data in IoT applications due to its lightweight and efficient structure is known as _____ file format. (CO3, K3)

(a) CSV (b) JSON

(c) XML (d) BSON

7. _____ characteristic enables smart objects in IoT to automatically discover and communicate with other devices or services. (CO4, K3)

(a) Autonomy

(b) Connectivity

(c) Context-Awareness

(d) Self-Organization

8. _____ IoT technology helps track patients' medication adherence and dosing schedules. (CO4, K3)

(a) Wearables (b) Mobile Apps

(c) Smart Pills (d) Telemedicine

9. Tn the SMARTIE approach, "I" stands for _____

(CO5, K1)

(a) Interoperability (b) Intelligence

(c) Integration (d) Innovation

10. Which of the following is the primary IoT security vulnerability that allows hackers to access and control devices? (CO5, K1)

(a) Weak Passwords

(b) Outdated Software

(c) Unencrypted Data

(d) Default Factory Settings

Part B (5 × 5 = 25)

Answer **all** questions not more than 500 words each.

11. (a) Discuss the vision of IoT in detail. (CO1, K2)

Or

(b) Explain about IoT related Standardization in detail. (CO1, K2)

12. (a) Write a note on Functional View of IoT in detail.

(CO2, K3)

Or

(b) Discuss the key components of IoT Reference Architecture in detail. (CO2, K3)

13. (a) Describe the IoT Boards :

(i) Rasperry Pi

(ii) Arduino. (CO3, K3)

Or

(b) Explain Date/Time Operations in python. (CO3, K3)

14. (a) How IoT works in Oil and Gas Industry? Explain.

(CO4, K3)

Or

(b) Explain the four aspects that convert your Business to Master IoT. (CO4, K3)

15. (a) Illustrate data platform for smart city. (CO5, K1)

Or

(b) Discuss the steps first taken towards secure platform in IoT. (CO5, K1)

Part C (5 × 8 = 40)

Answer **all** questions not more than 1000 words each.

16. (a) Illustrate IoT Infrastructure with neat sketch.

(CO1, K2)

Or

(b) Discuss about the Security and Privacy issues in IoT. (CO1, K2)

17. (a) Illustrate Deployment and Operational view of IoT in detail. (CO2, K3)

Or

(b) Write a detailed note on IoT Reference model. (CO2, K3)

18. (a) Describe in detail about File Handling methods in Python. (CO3, K3)

Or

(b) What are the steps involved in IoT design methodology Explain in detail. (CO3, K3)

19. (a) Explain in detail about IoT applications for industry. (CO4, K3)

Or

(b) Write a detailed note on Brownfield IoT. (CO4, K3)

20. (a) Illustrate FP7 icore Access framework with neat sketch. (CO5, K1)

Or

(b) Write a detailed note on SMARTIE Approach.

(CO5, K1)

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R3554

Sub. Code
2MS3C2

M.Voc. DEGREE EXAMINATION, NOVEMBER – 2025

Third Semester

Software Development

FUNDAMENTALS OF DATA SCIENCE

(CBCS – 2022 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 1 = 10)

Answer **all** the following objective type questions by choosing the correct option.

1. The process of identifying, acquiring, and preparing data for analysis is known as (CO1, K1)

   (a) Data Visualization

   (b) Data Mining

   (c) Data Wrangling

   (d) Data Modeling

2. NoSQL databases are designed to handle large amounts of _____ data, providing flexible schema designs and scalable storage. (CO1, K1)

   (a) Structured (b) Semi-structured

   (c) Unstructured (d) Relational

3. ———— involves transforming and aligning data from diverse sources into a unified format for analysis. (CO2, K3)

   (a) Data Integration

   (b) Mapping

   (c) Data Transformation

   (d) Data Warehousing

4. The K-Means algorithm aims to partition data into ———— clusters, that minimize the sum of squared distances between data points and cluster centroids. (CO2, K3)

(a) Overlapping (b) Hierarchical

(c) Non-overlapping (d) Fuzzy

5. ———— package in R provides a grammar of data manipulation and making it easier to work with Data Frames. (CO3, K4)

(a) dplyr (b) tidyr

(c) caret (d) ggplot2

6. ———— distribution is a continuous probability distribution commonly observed in natural phenomena, characterized by a bell-shaped curve. (CO3, K4)

(a) Uniform (b) Normal

(c) Poisson (d) Exponential

7. In Hadoop MapReduce, the ———— function takes input data, processes it, and produces key-value pairs as output. (CO4, K5)

(a) Reduce (b) Map

(c) Combine (d) Partition

8. ———— phase ensures that output keys are sorted and partitioned across reducers and enabling efficient aggregation and analysis. (CO4, K4)

(a) Shuffle (b) Sort

(c) Partition (d) Combine

9. Effective documentation in data science projects ensures ————. (CO5, K5)

(a) Data Quality

(b) Model Accuracy

(c) Transparency and Understanding

(d) Computational Efficiency

10. In R, the plot() function is a generic function that creates a ———————— of data, allowing customization through various parameters and arguments. (CO5, K5)

(a) Histogram (b) Scatterplot

(c) Visualization (d) Graphical representation

Part B (5 × 5 = 25)

Answer **all** questions not more than 500 words each.

11. (a) Discuss the Role of Data Scientist in detail. (CO1, K2)

Or

(b) Write a note on NoSQL. (CO1, K2)

12. (a) Discuss in detail about Naïve Bayes algorithm. (CO2, K3)

Or

(b) Compare Linear and Logistic Regression. (CO2, K3)

13. (a) Describe the concept of arrays in R. (CO3, K4)

Or

(b) How to read data from files in R? Explain. (CO3, K4)

14. (a) Differentiate Hadoop and RDBMS. (CO4, K5)

Or

(b) Explain Matrix vector Multiplication using Map Reduce. (CO4, K5)

15. (a) Compare documentation and deployment. (CO5, K5)

Or

(b) Write a detailed note on plot() function. (CO5, K5)

Part C (5 × 8 = 40)

Answer **all** questions not more than 1000 words each.

16. (a) How to work with Relational Database? Explain in detail. (CO1, K2)

Or

(b) Analyze the Stage of Data Science Project in detail. (CO1, K2)

17. (a) Describe in detail about Cluster Analysis. (CO2, K3)

Or

(b) Explain K-mean Algorithm in detail. (CO2, K3)

18. (a) Demonstrate about Statistical models in R. (CO3, K4)

Or

(b) Explain in detail about matrices in R with example. (CO3, K4)

19. (a) Illustrate about MapReduce Architecture with a neat sketch. (CO4, K5)

Or

(b) Discuss in detail about Shuffling and Sorting. (CO4, K5)

20. (a) Illustrate in detail about Effective Presentation. (CO5, K5)

Or

(b) How to display multivariate data? Explain in detail. (CO5, K5)

R3555

Sub. Code
2MS3C3

M.Voc. DEGREE EXAMINATION, NOVEMBER – 2025

Third Semester

Software Development

FUNDAMENTALS OF AI AND ML

(CBCS – 2022 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 1 = 10)

Answer **all** the following objective type questions by choosing the correct option.

1. Which of the following is not a branch of AI? (CO1, K1)

   (a) Machine Learning

   (b) Natural Language Processing

   (c) Quantum Mechanics

   (d) Robotics

2. PEAS in AI stand for_____ (CO1, K1)

   (a) Performance, Environment, Actuators, Sensors

   (b) Plan, Execute, Analyze, Simulate

   (c) Problem, Environment, Actuators, Solution

   (d) Process, Evaluate, Analyze, Sensors

3. ———————— is not a characteristic of hill climbing search algorithm (CO1, K2)

(a) Greedy approach

(b) Backtracking

(c) Local search

(d) Can get stuck in local maxima

4. ———————— is the example of a heuristic search technique (CO2, K2)

(a) Breadth-first search

(b) Depth-first search

(c) A* algorithm

(d) Uniform cost search

5. Semantic networks are primarily used to represent ———————— (CO3, K2)

(a) Procedural knowledge

(b) Hierarchical relationships and associations

(c) Decision-making strategies

(d) Temporal events

6. In First Order Logic, a predicate is used to ———————— (CO3, K2)

(a) Objects

(b) Relationships between objects

(c) Actions

(d) Variables

7. ———————— is the primary goal of unsupervised learning (CO4, K2)

(a) Predict a target variable

(b) Find hidden patterns or structures in data

(c) Minimize prediction error

(d) Maximize the performance of classification tasks

8. In supervised learning, the training dataset consists of ———————— (CO4, K2)

(a) Input features only

(b) Output labels only

(c) Input features and output labels

(d) None of the above

9. Which of the following is not a component of a Markov Decision Process (MDP)? (CO5, K2)

(a) States

(b) Actions

(c) Feedback loops

(d) Transition probabilities

10. In Reinforcement Learning, what does the term "agent" refer to? (CO5, K2)

(a) A person supervising the learning process

(b) A software program making decisions

(c) A labeled data point

(d) A neural network architecture

Part B (5 × 5 = 25)

Answer **all** questions not more than 500 words each.

11. (a) Describe the Components of AI. (CO1, K1)

Or

(b) Illustrate the structure of intelligent agent. (CO1, K1)

12. (a) Differentiate between informed and uninformed search techniques. (CO1, K2)

Or

(b) Explain the process of problem reduction with an example. (CO1, K1)

13. (a) Write note on Unification Algorithm in AI. (CO3, K2)

Or

(b) Describe a semantic network in detail. (CO3, K2)

14. (a) Discuss the machine learning Application in various domain. (CO4, K4)

Or

(b) Compare and contrast supervised and unsupervised learning. (CO4, K2)

15. (a) Discuss the components of Reinforcement Learning. (CO5, K2)

Or

(b) Discuss in detail about swarm Models. (CO2, K1)

Part C (5 × 8 = 40)

Answer **all** questions not more than 1000 words each.

16. (a) Elucidate branches of AI in detail. (CO1, K1)

Or

(b) Discuss the Artificial Intelligence applications in different domains. (CO1, K1)

17. (a) Explain the concept of Production System in AI. (CO1, K2)

Or

(b) Discuss about Constraint Satisfaction Problems (CSP) with example. (CO1, K1)

18. (a) Explain the knowledge representation structures in artificial intelligence. (CO3, K2)

Or

(b) Illustrate First Order Logic with step-by step example. (CO3, K2)

19. (a) Explain supervised learning model in detail. (CO4, K4)

Or

(b) Describe the concept of semi-supervised learning with example. (CO4, K2)

20. (a) Describe Markov Decision Problem (MDP) framework with its key elements. (CO5, K2)

Or

(b) Explain the concept of Q-learning with example. (CO2, K1)

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R3556

Sub. Code
2MS3E3

M.Voc. DEGREE EXAMINATION, NOVEMBER – 2025

Third Semester

Software Development

Elective – CLOUD COMPUTING

(CBCS – 2022 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 1 = 10)

Answer **all** the following objective type questions by choosing the correct option.

1. Cloud computing process ensures efficient resource utilization by distributing workloads across multiple resources is called (CO1, K1)

   (a) Load Balancing

   (b) Resource Pooling

   (c) Auto-Scaling

   (d) Service Orchestration

2. Virtualized computing resources provides _____ type of cloud services. (CO1, K1)

   (a) IaaS (b) PaaS

   (c) SaaS (d) DaaS

3. Which of the following cloud architecture pattern involves breaking down applications into smaller, independent services? (CO2, K2)

(a) Monolithic Architecture

(b) Microservices Architecture

(c) Event-Driven Architecture

(d) Serverless Architecture

4. _____ is the design principle ensures resource availability despite failures. (CO2, K2)

(a) Scalability

(b) Fault Tolerance

(c) Elasticity

(d) Redundancy

5. _____is a cloud storage feature that ensures data stored in multiple locations, protecting against data loss. (CO3, K3)

(a) Replication (b) Backup

(c) Snapshot (d) Encryption

6. PaaS provide _____ feature for app development. (CO3, K3)

(a) Tools and Runtime

(b) Storage and Security

(c) Infrastructure and OS

(d) Software and Hardware

7. Cloud data security control ensures that only authorized users can access and manage encryption keys is called _____. (CO4, K5)

(a) Data Encryption

(b) Access Control

(c) Key Management

(d) Identity and Access Management

8. Which of the following technology enables Cloud Mashups by allowing different services to communicate? (CO4, K5)

(a) APIs (b) Web Services

(c) SOA (d) ESB

9. _____ enables cloud applications to scale automatically. (CO5, K5)

(a) Load Balancer

(b) Auto-Scaling

(c) Cloud Storage

(d) Serverless Computing

10. Which of the following is the core cloud computing platform offered by Microsoft? (CO5, K5)

(a) Microsoft Azure

(b) Microsoft Office 365

(c) Microsoft Dynamics 365

(d) Microsoft Visual Studio

Part B (5 × 5 = 25)

Answer **all** questions not more than 500 words each.

11. (a) Write the advantages and disadvantages of Cloud Computing. (CO1, K1)

Or

(b) Discuss the Characteristics of Cloud Computing. (CO1, K1)

12. (a) Illustrate the phases of CDLC with neat sketch. (CO2, K2)

Or

(b) Write a note on Pitfalls. (CO2, K2)

13. (a) Differentiate DAS, SAN and NAS. (CO3, K3)

Or

(b) Write a note on STaaS. DaaS and INaaS. (CO3, K3)

14. (a) Discuss about types of Risks in Cloud Computing. (CO4, K5)

Or

(b) Explain Cloud Mashups in detail. (CO4, K5)

15. (a) Write a note on Microsoft Cloud Services. (CO5, K5)

Or

(b) Illustrate the Procedure of moving applications to the Cloud. (CO5, K5)

Part C (5 × 8 = 40)

Answer **all** questions not more than 1000 words each.

16. (a) Explain about various types of Cloud Computing. (CO1, K1)

Or

(b) Discuss about Cloud Service model in detail. (CO1, K1)

17. (a) Describe Virtualization and its types in detail. (CO2, K2)

Or

(b) How to develop holistic Cloud computing Reference Model? Explain in detail. (CO2, K2)

18. (a) Demonstrate CDMI and its requirements in detail. (CO3, K3)

Or

(b) Elucidate the features of Web Application framework in detail. (CO3, K3)

19. (a) Write a detailed note on Data Confidentiality, Data Integrity and Data Availability. (CO4, K5)

Or

(b) Explain the Tools and Technologies available for Cloud Computing in detail. (CO4, K5)

20. (a) Explain in detail about Google Cloud Applications. (CO5, K5)

Or

(b) What are the Cloud Services provided by Amazon? Discuss in detail. (CO5, K5)

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