

R3647

Sub. Code

557301

M.Sc. DEGREE EXAMINATION, NOVEMBER – 2025

Third Semester

Artificial Intelligence and Data Science

BIG DATA ANALYTICS

(CBCS – 2023 onwards)

Time : 3 Hours

Maximum : 75 Marks

Part A

(10 × 1 = 10)

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

- _____ is the structured data type. (CO1, K1)
 - Transaction data
 - Online analytical processing [OLAP] data cubes
 - CSV files
 - All of the above
- _____ is a free, open source, powerful tool for working with messy data. (CO1, K1)
 - Hadoop
 - Open Refine
 - Alpine Miner
 - All of the above
- _____ error is the rejection of the null hypothesis when the null hypothesis is TRUE. (CO2, K1)
 - Type I
 - Type II
 - Type III
 - Type IV
- _____ can occur due to acts of omission. (CO2, K1)
 - Messy data
 - Dirty data
 - Missing data
 - None

5. _____ technique for grouping similar objects. (CO3, K1)
- (a) Clustering (b) Classification
(c) Regression (d) None
6. _____ is a related modeling technique in which the penalty is proportional to the sum of the absolute values of the coefficients. (CO3, K1)
- (a) Lasso regression
(b) Linear Regression
(c) Classification
(d) None
7. _____ is defined as the percentage of documents in the results that are relevant. (CO4, K1)
- (a) Recall (b) Precision
(c) Confusion Matrix (d) All of the above
8. _____ can find words and strings that match particular patterns in the text effectively. (CO4, K1)
- (a) Regular expressions
(b) Bayes Theorem
(c) Regression
(d) None
9. _____ Provides a high-level data-flow programming language. (CO5, K1)
- (a) Pig (b) Hive
(c) Hbase (d) Latin
10. _____ paradigm provides the means to break a large task into smaller tasks. (CO5, K1)
- (a) HDFS (b) Hive
(c) Pig (d) MapReduce

Part B

(5 × 5 = 25)

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

11. (a) What are the three characteristics of Big Data, and what are the main considerations in processing Big Data? (CO1, K1)

Or

- (b) Explain Common Tools for the Model Building Phase. (CO1, K2)

12. (a) Narrate NOIR Attribute Types. (CO2, K2)

Or

- (b) Explain Type I and Type II Errors. (CO2, K2)

13. (a) Write down the general logic behind association rules. (CO3, K3)

Or

- (b) Narrate the applications of Association Rules. (CO3, K1)

14. (a) What are the things to consider when selecting a classifier? (CO4, K1)

Or

- (b) Explain Bayes' Theorem. (CO4, K2)

15. (a) Describe four common deliverables for an analytics project. (CO5, K2)

Or

- (b) Narrate the Regular Expression Operators. (CO5, K2)

Part C

(5 × 8 = 40)

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

16. (a) Describe the challenges of the current analytical architecture for data scientists. (CO1, K2)

Or

- (b) What are the benefits of doing a pilot program before a full-scale rollout of a new analytical methodology? Discuss this in the context of the mini case study. (CO1, K3)

17. (a) Describe how dirty data can be detected in the data exploration phase with visualizations. (CO2, K3)

Or

- (b) Elucidate the functions for Visualizing a Single Variable. (CO2, K3)

18. (a) Describe how logistic regression can be used as a classifier. (CO3, K2)

Or

- (b) Describe the k-means algorithm to find k clusters. (CO3, K2)

19. (a) (i) Explain the trade-offs for precision and recall
(ii) What is a caveat of IOF? How does TFIDF address the problem? (CO4, K3)

Or

- (b) Describe the methods for sentiment analysis. (CO4, K2)

20. (a) Discuss Data Analytics Lifecycle. (CO5, K3)

Or

- (b) Explain the Common Tools for Data Visualization. (CO5, K2)

R3648

Sub. Code

557302

M.Sc. DEGREE EXAMINATION, NOVEMBER – 2025

Third Semester

Artificial Intelligence and Data Science

DATA VISUALIZATION

(CBCS – 2023 onwards)

Time : 3 Hours

Maximum : 75 Marks

Part A

(10 × 1 = 10)

Answer **all** questions by choosing the correct option.

1. What is the primary goal of data visualization? (CO1, K1)
 - (a) To organize raw data
 - (b) To help make data insights accessible and understandable
 - (c) To collect and process data
 - (d) To replace the need for data analysis
2. Which of the following is a common type of chart used for comparing quantities? (CO1, K1)
 - (a) Line chart
 - (b) Scatter plot
 - (c) Bar chart
 - (d) Pie chart
3. _____ file contain no extraneous coding or meta information. (CO2, K1)
 - (a) csv
 - (b) txt
 - (c) xml
 - (d) html
4. _____ makes it possible for you to read text files without refreshing the page. (CO2, K1)
 - (a) XML
 - (b) CSV
 - (c) Ajax
 - (d) D3

5. _____ is a JavaScript library for general purpose visualization. (CO3, K1)
- (a) XML (b) CSV
(c) Ajax (d) D3
6. SVG stands for (CO3, K1)
- (a) Support Vector Graphics
(b) Scalable Vector Graphics
(c) Super Vector Graphics
(d) None
7. Which D3.js method is used to add new elements to a chart when new data is introduced? (CO4, K3)
- (a) enter() (b) exit()
(c) update() (d) append()
8. What is the main purpose of a data join in D3.js? (CO4, K1)
- (a) To filter the data before visualization
(b) To bind data to DOM elements for visualization
(c) To calculate the average of the data
(d) To remove unnecessary data from the chart
9. What is the primary purpose of an information dashboard? (CO5, K1)
- (a) To display data in a detailed report format
(b) To provide an interactive environment for data analysis
(c) To visualize key metrics and insights for quick decision-making
(d) To store large datasets for offline analysis
10. Which of the following is NOT a common type of chart used in dashboards? (CO5, K1)
- (a) Line chart (b) Pie chart
(c) Waterfall chart (d) Histogram

Part B

(5 × 5 = 25)

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

11. (a) Explain XML Format. (CO1, K1)

Or

- (b) How the HTML5 canvas differs from SVG, Flash and other graphics tools. (CO1, K3)

12. (a) Explain the difference between a line chart and a bar chart in terms of their use cases. (CO2, K3)

Or

- (b) With suitable example explain XML Format. (CO2, K3)

13. (a) What is D3.js and what is its primary use? (CO3, K1)

Or

- (b) How does D3.js handle large datasets for visualization? (CO3, K3)

14. (a) Elaborate on Data joins. (CO4, K3)

Or

- (b) Explain the process to Make charts interactive. (CO4, K3)

15. (a) Discuss the Dashboard design issues. (CO5, K3)

Or

- (b) Explain the procedure to Design Bullet Graphs. (CO5, K3)

Part C

(5 × 8 = 40)

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

16. (a) Describe the Data visualization process. (CO1, K3)

Or

- (b) Discuss the Applications of Data Visualization. (CO1, K3)

17. (a) (i) How to use the Google Charts API to animate a bar chart.
(ii) How to use the Google Charts API to render a bar chart, a pie chart and a 3D pie chart. (CO2, K3)

Or

- (b) Narrate workflow for incorporating XSLT methodology. (CO2, K3)

18. (a) Describe the D3 Data formats in detail. (CO3, K3)

Or

- (b) Explain the process to loading data using D3 's functions. (CO3, K3)

19. (a) Provide an example scenario where using a key function in a data join would be essential. (CO4, K3)

Or

- (b) With suitable example explain the procedure to Update charts. (CO4, K3)

20. (a) Describe the Dashboard Display Media in detail. (CO5, K3)

Or

- (b) Explain the process to Design Sparklines. (CO5, K3)

R3649

Sub. Code

557303

M.Sc. DEGREE EXAMINATION, NOVEMBER – 2025

Third Semester

Artificial Intelligence and Data Science

VIRTUAL REALITY AND AUGMENTED REALITY

(CBCS – 2023 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 device is primarily used to track the user's head movement in VR? (CO1, K2)
 - (a) Tracker
 - (b) Digital Glove
 - (c) Haptic Device
 - (d) Monitor

2. Virtual Reality allows users to _____ . (CO1, K1)
 - (a) Browse the internet faster
 - (b) Experience immersive 3D environments
 - (c) Create databases
 - (d) Edit videos

3. _____ is an output device in VR. (C02,K2)
- (a) Tracker
 - (b) Haptic Device
 - (c) Motion Capture
 - (d) Sensor
4. Real-time rendering in VR helps to _____. (CO2, K1)
- (a) Create interactive graphics instantly
 - (b) Manage databases
 - (c) Encrypt data
 - (d) Compress files
5. Physically-based simulation in VR ensures _____ . (CO3, K2)
- (a) Accurate rendering of user gestures
 - (b) Realistic interactions based on physics laws
 - (c) Faster internet connectivity
 - (d) Database integrity
6. Hand gestures and object grasp are examples of _____. (CO3, K1)
- (a) Interactive VR techniques
 - (b) Input hardware
 - (c) AR mapping techniques
 - (d) Development tools

7. Augmented Reality overlays virtual objects _____ . (CO4, K2)
- (a) Over a completely virtual environment
 - (b) On real-world scenes
 - (c) Only on computer screens
 - (d) On VR headsets exclusively
8. AR key technologies include _____ . (CO4, K1)
- (a) 3D Menus
 - (b) Geo-location and tracking
 - (c) MultiGen
 - (d) Vega
9. VR development frameworks include _____ . (CO5, K2)
- (a) X3D, Vega, Virtools
 - (b) Photoshop, AutoCAD, Excel
 - (c) GPS, Sensor, Tracker
 - (d) Blender, Illustrator, Maya
10. VR is commonly applied in _____ . (CO5, K1)
- (a) Physical exercises and games
 - (b) Word processing
 - (c) Email management
 - (d) Spreadsheet analysis

Part B

(5 × 5 = 25)

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

11. (a) Illustrate the fundamental concept of Virtual Reality (CO1, K2)

Or

- (b) Describe the primary features of Virtual Reality. (CO1, K1)

12. (a) Discuss input devices such as trackers, sensors, and digital gloves in VR. (CO2, K3)

Or

- (b) Explain visual computation and stereoscopic display techniques in VR. (CO2, K2)

13. (a) Explain geometric modeling and behaviour simulation in VR (CO3, K2)

Or

- (b) Discuss hand gestures and body tracking in detail. (CO3, K3)

14. (a) Illustrate Key Technology in AR. (CO4, K4)

Or

- (b) Discuss AR applications in geo-location. (CO4, K3)

15. (a) Illustrate about VR development tools. (CO5, K2)

Or

- (b) Discuss about VR applications in digital entertainment. (CO5, K4)

Part C

(5 × 8 = 40)

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

16. (a) Explain the evolution of VR in detail. (CO1, K2)

Or

- (b) Illustrate the components of VR with a block diagram and explain their function. (CO1, K1)

17. (a) Explain 3D Menus and 3D Scanner in VR with examples. (CO2, K4)

Or

- (b) How to manage large scale environments by CG Techniques? Explain (CO2, K4)

18. (a) Explain physically based simulation with examples. (CO3, K4)

Or

- (b) Describe object grasp and 3D menu interaction with its principles (CO3, K2)

19. (a) Discuss customization and development of AR technologies. (CO4, K3)

Or

- (b) Explain Augmented City Maps in detail. (CO4, K4)

20. (a) Illustrate VR frameworks in detail. (CO5, K2)

Or

(b) Discuss VR Technology in Physical Exercises and Games. (CO5, K3)

R3650

Sub. Code

557304

M.Sc. DEGREE EXAMINATION, NOVEMBER – 2025

Third Semester

Artificial Intelligence and Data Science

INTERNET OF THINGS

(CBCS – 2023 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. What is the primary goal of IoT? (CO1, K2)
 - (a) Data Storage
 - (b) Connecting devices and enabling communication
 - (c) Software Development
 - (d) High-Speed Processing

2. Which of the following is NOT an IoT enabling technology? (CO1, K2)
 - (a) Cloud Computing
 - (b) Blockchain
 - (c) Machine Learning
 - (d) Mechanical Engineering

3. What is the role of ETSI architecture in IoT? (CO2, K4)
- (a) Standardization of IoT
 - (b) Cloud Services
 - (c) Data Storage
 - (d) Device Manufacturing
4. Which of the following models is NOT a part of IoT reference architecture? (CO2, K4).
- (a) Functional Model
 - (b) Information Model
 - (c) Data Mining Model
 - (d) Communication Model
5. Which networking layer protocol is specifically designed for IoT? (CO3, K4)
- (a) TCP
 - (b) 6LoWPAN
 - (c) HTTP
 - (d) SMTP
6. What is a key security challenge in IoT protocols? (CO3, K4)
- (a) Data Encryption
 - (b) Hardware Cost
 - (c) Power Consumption
 - (d) Bandwidth Allocation

7. What is the primary use of Raspberry Pi in IoT? (CO4, K2)
- (a) Data Processing
 - (b) Device Connectivity
 - (c) Cloud Storage
 - (d) Hardware Design
8. What programming language is commonly used for Raspberry Pi-based IoT systems? (CO4, K2)
- (a) Java
 - (b) Python
 - (c) C++
 - (d) Ruby
9. What is the primary goal of Smart Cities in IoT applications? (CO5, K5)
- (a) Urban Development and Automation
 - (b) Cloud Storage
 - (c) Social Media Connectivity
 - (d) Mobile Communication
10. Which of the following is NOT a real-world IoT application? (CO5, K5)
- (a) Industrial Automation
 - (b) Asset Management
 - (c) Quantum Computing
 - (d) Smart Grid

Part B

(5 × 5 = 25)

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

11. (a) Define IoT and describe its physical and logical design. (CO1, K2)

Or

- (b) Explain the different levels of IoT deployment with examples. (CO1, K2)

12. (a) Explain M2M communication and its significance in IoT. (CO2, K4)

Or

- (b) Describe the ETSI and IETF architecture models for IoT. (CO2, K4)

13. (a) Explain the importance of protocol standardization in IoT. (CO3, K4)

Or

- (b) Describe the SCADA and RFID protocols used in IoT. (CO3, K4)

14. (a) Explain the role of Raspberry Pi in IoT applications. (CO4, K2)

Or

- (b) Discuss different IoT platforms and their role in system development. (CO4, K2)

15. (a) Explain the impact of IoT on Industrial Automation. (CO5, K5)

Or

- (b) Describe different data analytics techniques used in IoT. (CO5, K5)

Part C (5 × 8 = 40)

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

16. (a) Explain in detail the IoT System Architecture and its components. (CO1, K2)

Or

- (b) What are the key design methodologies of IoT platforms? Explain with examples. (CO1, K2)

17. (a) How can web services be used to access and control IoT devices? Explain with an example. (CO2, K4)

Or

- (b) Describe the IoT communication protocol and their significance. (CO2, K4)

18. (a) Compare BACNet and Zigbee architecture in IoT. (CO3, K4)

Or

- (b) Explain the role of 6LoWPAN in IoT with its working principles. (CO3, K4)

19. (a) Discuss different IoT platforms and their role in system development. (CO4, K2)

Or

- (b) How does an Arduino differ from Raspberry Pi in IoT applications? (CO4, K2)

20. (a) Discuss different case studies on IoT applications. (CO5, K4).

Or

- (b) Explain how Amazon Web Services support IoT solutions. (CO5, K4)

R3651

Sub. Code

557559

M.Sc. DEGREE EXAMINATION, NOVEMBER – 2025

Third Semester

Artificial Intelligences and Data Science

Elective : SOCIAL MEDIA ANALYTICS

(CBCS – 2023 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. What does web analytics primarily help businesses to measure? (CO1, K1)
 - (a) Social media engagement
 - (b) User interaction with their website
 - (c) Brand awareness
 - (d) Offline sales performance

2. Which of the following is a popular web analytics tool? (CO1, K1)
 - (a) Adobe Photoshop
 - (b) Google Analytics
 - (c) Microsoft Word
 - (d) Spotify

3. What is a social network? (CO2, K1)
- (a) A network of people using a particular website
 - (b) A set of nodes (individuals or organizations) connected by relationships or interactions
 - (c) A collection of social media platforms
 - (d) A network of computers connected by the internet
4. Which of the following represents a “node” in a social network? (CO2, K2)
- (a) A relationship or interaction between two individuals
 - (b) An individual or organization within the network
 - (c) The number of connections between people
 - (d) A hyperlink between websites
5. What are web metrics, and why are they important for measuring the performance of a website? (CO3, K1)
- (a) They provide a set of technical measures to enhance web security
 - (b) They measure the effectiveness of web pages in attracting and engaging visitors
 - (c) They analyze the website’s code for errors and bugs
 - (d) They track the performance of web hosting servers

6. What does the metric “bounce rate” indicate on a website?
(CO3, K2)
- (a) The percentage of visitors who leave the website after visiting only one page
 - (b) The total number of visitors to the site during a given period
 - (c) The number of purchases made during a visit
 - (d) The average duration a user spends on the website
7. What does Social Network Analysis (SNA) primarily focus on?
(CO4, K3)
- (a) Analyzing the structure and behavior of individual nodes (people or entities)
 - (b) Examining the connections and relationships between nodes in a network
 - (c) Analyzing the flow of money in social networks
 - (d) Studying online behavior of users on social media platforms
8. Which of the following Facebook Analytics tools provides detailed insights into the performance of your Facebook Ads?
(CO4, K2)
- (a) Facebook Insights
 - (b) Facebook Audience Insights
 - (c) Facebook Ad Manager
 - (d) Facebook Pages Manager

9. What is the main purpose of qualitative analysis? (CO5, K1)
- (a) To quantify data and establish numerical patterns
 - (b) To explore, understand, and interpret complex phenomena
 - (c) To test hypotheses in a structured manner
 - (d) To validate existing theories
10. Which of the following is a limitation of Web Analytics 1.0? (CO5, K2)
- (a) It allowed real-time tracking of user interactions
 - (b) It focused only on tracking traffic from desktop devices
 - (c) It provided in-depth user segmentation and profiling
 - (d) It enabled detailed insights into customer purchase journeys

Part B (5 × 5 = 25)

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

11. (a) Explain the building blocks of web analytics. (CO1, K1)
- Or
- (b) List out the differences between Offsite web and on site web. (CO1, K1)
12. (a) Write a short note on search engine data. (CO2, K2)
- Or
- (b) Briefly explain web Beacons. (CO2, K2)

13. (a) Write a short note on Web crawling. (CO3, K1)

Or

(b) Write a short note on Random graphs. (CO3, K1)

14. (a) Describe the benefits of site visits. (CO4, K3)

Or

(b) Explain the procedure to creating and running a survey. (CO4, K4)

15. (a) List the benefits of surveys. (CO5, K4)

Or

(b) What is the role of Web analytics 1.0? List its limitations. (CO5, K1)

Part C

(5 × 8 = 40)

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

16. (a) Discuss the importance of social media analytics in shaping marketing strategies. (CO1, K1)

Or

(b) List the applications of SMA in different social media platforms. (CO1, K1)

17. (a) Describe the common metrics of Web. (CO2, K2)

Or

(b) Briefly explain the Key Performance Indicator. (CO2, K2)

18. (a) Elaborate on Categories of traffic. (CO3, K2)

Or

(b) Describe the Social Network Analysis. (CO3, K2)

19. (a) Explain the different forms of Surveys. (CO4, K3)

Or

(b) Explain the procedure to Conducting a heuristic evaluation. (CO4, K3)

20. (a) Elaborate on Google website optimizer. (CO5, K4)

Or

(b) Analyse page audience in detail. (CO5, K5)
