



UNITED INSTITUTE OF TECHNOLOGY

(An Autonomous Institution)

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Periyanaickenpalayam, Coimbatore – 641020



Master of Engineering

**DEPARTMENT OF ARTIFICIAL INTELLIGENCE AND DATA
SCIENCE**

QUESTION BANK

I YEAR

EVEN SEMESTER

ACADEMIC YEAR 2024 – 2025

w.e.f:

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HEAD OF THE DEPARTMENT

IQAC DIRECTOR

PRINCIPAL

CHAIRMAN

24AIPPC201
WEB ANALYTICS AND INTELLIGENCE



UNIT I

INTRODUCTION AND DATA COLLECTION

Definition, Process, Key terms: Site references, Keywords and Key phrases; building block terms: Visit characterization terms, Content characterization terms, Conversion metrics; Categories: Offsite web, On site web; Web analytics platform, Web analytics evolution, Need for web analytics, Advantages, Limitations. Clickstream Data: Web logs, Web Beacons, JavaScript tags, Packet Sniffing; Outcomes Data : E-commerce, Lead generation, Brand/Advocacy and Support; Research data: Mindset, Organizational structure, Timing; Competitive Data: Panel-Based measurement, ISP-based measurement, Search Engine data.

Q.No	Question	CO	BTL	Marks
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PART A

1.	Define Web Analytics.	1	1	2
2.	What is meant by conversion rate in web analytics?	1	1	2
3.	List any two key terms used in web analytics.	1	1	2
4.	What are Web Beacons?	1	2	2
5.	Define Clickstream Data.	1	1	2
6.	Mention two advantages of Web Analytics.	1	1	2
7.	What is meant by competitive data?	1	2	2
8.	What is the role of JavaScript tags in Web Analytics?	1	1	2

PART B

1.	Explain the process of Web Analytics with a suitable example.	1	2	16
2.	Discuss various data collection methods used in Web Analytics.	1	2	16
3.	Describe the outcomes of Web Analytics in E-commerce	1	2	16
4.	Explain Panel-Based measurement and ISP-based measurement in detail.	1	2	16

UNIT 2

QUALITATIVE AND WEB ANALYTICS FUNDAMENTALS

Heuristic evaluations: Conducting a heuristic evaluation, Benefits of heuristic evaluations; Site Visits: Conducting a site visit, Benefits of site visits; Surveys: Website surveys, Post -visit surveys, Creating and running a survey, Benefits of surveys. Capturing data: Web logs or JavaScripts tags, Separate data serving and data capture, Type and size of data, Innovation, Integration, Selecting optimal web analytic tool, Understanding clickstream data quality, Identifying unique page definition, Using cookies, Link coding issues.

Q.No	Question	CO	BTL	Marks
PART A				
1	What is heuristic evaluation?	2	1	2
2	Define a site visit in Web Analytics.	2	1	2
3	Mention two benefits of heuristic evaluation.	2	1	2
4	What are post-visit surveys?	2	2	2
5	What is the role of innovation in Web Analytics?	2	1	2
6	Define clickstream data analysis.	2	1	2
7	What are JavaScript tags in data capturing?	2	2	2
8	What is a qualitative web analytic tool?	2	1	2
PART B				
1	Explain the process of conducting heuristic evaluation.	2	2	16
2	Discuss various methods of capturing website visitors' data.	2	2	16
3	Explain the challenges in selecting an optimal web analytic tool.	2	2	16
4	How is qualitative analysis used to resolve coding issues?	2	2	16

UNIT 3

WEB METRICS

Common metrics: Hits, Page views, Visits, Unique visitors, Unique page views, Bounce, Bounce rate, Page/visit, Average time on site, New visits; Optimization(e-commerce, non e-commerce sites): Improving bounce rates, Optimizing adwords campaigns; Real time report, Audience report, Traffic source report, Custom campaigns, Content report, Google analytics, Introduction to KPI, characteristics, Need for KPI, Perspective of KPI, Uses of KPI.

Q.No	Question	CO	BTL	Marks
PART A				
1	What is meant by a page visit?	3	1	2
2	Define Bounce Rate.	3	1	2
3	What is the difference between Unique Visitors and New Visits?	3	1	2
4	Define Exit Rate.	3	2	2
5	What is a Content Report in Web Analytics?	3	1	2
6	Mention two ways to improve bounce rate.	3	1	2
7	Define KPI in Web Analytics.	3	2	2
8	What is the role of audience reports in Web Analytics?	3	1	2
PART B				
1	Explain different types of Web Metrics with examples.	3	2	16
2	Discuss the importance of KPI in Web Analytics.	3	2	16
3	Explain how traffic source reports help in business decision-making.	3	2	16
4	Discuss the process of optimizing bounce rate and improving visitor engagement.	3	2	16

UNIT 4
WEB ANALYTICS 2.0

Web analytics 1.0, Limitations of web analytics 1.0, Introduction to analytic 2.0, Competitive intelligence analysis : CI data sources, Toolbar data, Panel data ,ISP data, Search engine data, Hybrid data, Website traffic analysis: Comparing long term traffic trends, Analyzing competitive site overlap and opportunities.

Q.No	Question	CO	BTL	Marks
PART A				
1	Define Web Analytics 2.0.	4	1	2
2	What are the limitations of Web Analytics 1.0?	4	1	2
3	What is Hybrid Data in Web Analytics?	4	1	2
4	Mention two features of Website Traffic Analysis.	4	2	2
5	Define JSP data in Web Analytics.	4	1	2
6	What is Tagging in Data Sources?	4	1	2
7	Define Toolbar Data in Web Analytics.	4	2	2
8	What is the importance of panel data in analytics?	4	1	2
PART B				
1	Explain the transition from Web Analytics 1.0 to Web Analytics 2.0.	4	2	16
2	Discuss the significance of Website Traffic Analysis in business strategies.	4	2	16
3	Explain different data sources used in Web Analytics 2.0.	4	2	16
4	Compare and contrast long-term and short-term traffic trends in Web Analytics.	4	2	16

UNIT 5

GOOGLE ANALYTICS AND RELEVANT TECHNOLOGIES

Brief introduction and working, Adwords, Benchmarking, Categories of traffic: Organic traffic, Paid traffic; Google website optimizer, Implementation technology, Limitations, Performance concerns, Privacy issues. Internet & TCP/IP, Client / Server Computing, HTTP (HyperText Transfer Protocol), Server Log Files & Cookies Web Bugs.

Q.No	Question	CO	BTL	Marks
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PART A

1	What is Google Analytics?	5	1	2
2	Define Paid Traffic.	5	1	2
3	What are Web Bugs?	5	1	2
4	Mention two limitations of Google Analytics.	5	2	2
5	What is the role of cookies in Web Analytics?	5	1	2
6	Define Client/Server Computing in Web Analytics.	5	1	2
7	What is HTTP and how does it relate to Web Analytics?	5	2	2
8	What is the difference between Organic Traffic and Paid Traffic?	5	1	2

1	Explain how Google Analytics works and its PART B key features.	5	2	16
2	Discuss the implementation methodology of Google Analytics in websites.	5	2	16
3	Explain Server Log Files and their role in Web Analytics.	5	2	16
4	Discuss common concerns in using Google Analytics and methods to overcome them.	5	2	16

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24AIPPC202
DATA HANDLING AND VISUALIZATION



UNIT I
INTRODUCTION TO DATA VISUALIZATION AND DATA
FOUNDATIONS

Definition and importance, Relationship between Visualization and Other Fields, Types of Data, Data Preprocessing, The Visualization Process, Semiology of Graphical Symbols, The Eight Visual Variables, Visualization Taxonomies.

Q.No	Question	CO	BTL	Marks
PART A				
1	Define Data Visualization.	1	1	2
2	What is the importance of data visualization?	1	1	2
3	List the types of data used in visualization.	1	1	2
4	What is the relationship between visualization and other fields?	1	2	2
5	Define Semiology of Graphical Symbols.	1	1	2
6	What are the eight visual variables?	1	1	2
7	What is meant by data preprocessing?	1	2	2
8	Define Visualization Taxonomies.	1	1	2
PART B				
1	Explain the data visualization process in detail with examples.	1	2	16
2	Discuss the different types of data used in visualization.	1	2	16
3	Explain the role of graphical symbols in data visualization.	1	2	16
4	Describe visualization taxonomies with appropriate examples.	1	2	16

UNIT 2

VISUALIZATION TECHNIQUES

Visualization Techniques for Spatial Data, Visualization Techniques for Geospatial Data, Visualization Techniques for Multivariate Data, Visualization Techniques for Trees, Graphs, and Networks, Text and Document Visualization

Q.No	Question	CO	BTL	Marks
PART A				
1	What are visualization techniques?	2	1	2
2	Define spatial data visualization.	2	1	2
3	Mention two techniques used for geospatial data visualization.	2	1	2
4	What is multivariate data visualization?	2	2	2
5	Define tree visualization.	2	1	2
6	What is network visualization?	2	1	2
7	Mention two examples of text visualization.	2	2	2
8	What is document visualization?	2	1	2
PART B				
1	Explain various visualization techniques used for spatial data.	1	2	16
2	Discuss different approaches to geospatial data visualization.	1	2	16
3	Explain tree, graph, and network visualization techniques with examples.	1	2	16
4	Compare and contrast text visualization and document visualization techniques.	1	2	16

UNIT 3
INTERACTION CONCEPTS AND TECHNIQUES

Interaction Operators, Interaction Operands and Spaces, Interaction Techniques

Q.No	Question	CO	BTL	Marks
PART A				
1	What are interaction operators in visualization?	3	1	2
2	Define interaction operands.	3	1	2
3	Mention two types of interaction spaces.	3	1	2
4	What is the importance of interaction techniques in visualization?	3	2	2
5	Define user interaction in data visualization.	3	1	2
6	Mention any two examples of interaction techniques.	3	1	2
7	What is the role of interaction operands?	3	2	2
8	List any two benefits of interaction in visualization.	3	1	2
PART B				
1	Explain various interaction operators in data visualization.	3	2	16
2	Discuss the concept of interaction operands and spaces in visualization.	3	2	16
3	Explain different interaction techniques used in data visualization.	3	2	16
4	Analyze the impact of user interaction on visualization efficiency.	3	2	16

UNIT 4
DESIGNING EFFECTIVE VISUALIZATIONS

Steps in Designing Visualizations, Problems in Designing Effective Visualizations

Q.No	Question	CO	BTL	Marks
PART A				
1	What are the steps in designing visualizations?	4	1	2
2	Define effective visualization.	4	1	2
3	Mention any two challenges in designing visualizations.	4	1	2
4	What is meant by visualization aesthetics?	4	2	2
5	Define user-centered design in visualization.	4	1	2
6	What is the role of feedback in visualization design?	4	1	2
7	List two factors affecting visualization effectiveness.	4	2	2
8	What is the importance of color schemes in visualization design?	4	1	2
PART B				
1	Explain the step-by-step process of designing an effective visualization.	4	2	16
2	Discuss the common problems faced in designing visualizations.	4	2	16
3	Explain the significance of user-centered design in visualization.	4	2	16
4	Analyze the role of aesthetics and perception in visualization effectiveness.	4	2	16

UNIT 5
EVALUATING VISUALIZATION TECHNIQUES AND RESEARCH
DIRECTIONS IN VISUALIZATION

User Tasks, User Characteristics, Data Characteristics, Visualization Characteristics, Structures for Evaluating Visualizations, Benchmarking Procedures. An Example of Visualization Benchmarking Issues of Data, Issues of Cognition, Perception, and Reasoning, Issues of System Design, Issues of Evaluation, Issues of Hardware, Issues of Applications

Q.No	Question	CO	BTL	Marks
PART A				
1	What are user tasks in visualization?	5	1	2
2	Define user characteristics in visualization.	5	1	2
3	Mention two data characteristics affecting visualization.	5	1	2
4	What is meant by visualization benchmarking?	5	2	2
5	Define issues of cognition in visualization.	5	1	2
6	What are system design issues in visualization?	5	1	2
7	Mention any two evaluation criteria for visualizations.	5	2	2
8	What is the role of hardware in visualization applications?	5	1	2
PART B				
1	Explain the various user tasks and characteristics involved in visualization.	5	2	16
2	Discuss the benchmarking procedures for evaluating visualization techniques.	5	2	16
3	Explain different issues affecting visualization, such as cognition and perception.	5	2	16
4	Analyze system design and evaluation issues in visualization applications.	5	2	16

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24AIPPC203
COMPUTER VISION



UNIT I

INTRODUCTION TO COMPUTER VISION

Image Processing, Computer Vision and Computer Graphics, Computer Vision Applications: Document Image Analysis, Biometrics, Object Recognition, Tracking, Medical Image Analysis, Content-Based Image Retrieval, Video Data Processing, Multimedia, Virtual Reality and Augmented Reality.

Q.No	Question	CO	BTL	Marks
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PART A

1	Define Computer Vision.	1	1	2
2	Differentiate between Image Processing, Computer Vision, and Computer Graphics.	1	1	2
3	List any two applications of Computer Vision.	1	1	2
4	What is Document Image Analysis?	1	2	2
5	Mention two applications of Biometrics in Computer Vision.	1	1	2
6	What is Content-Based Image Retrieval (CBIR)?	1	1	2
7	How is Computer Vision used in Medical Image Analysis?	1	2	2
8	What is the difference between Virtual Reality (VR) and Augmented Reality (AR)?	1	1	2

PART B

1	Explain the differences between Computer Vision, Image Processing, and Computer Graphics with examples.	1	2	16
2	Discuss various applications of Computer Vision such as Biometrics, Medical Imaging, and Augmented Reality.	1	2	16
3	Describe the importance of Content-Based Image Retrieval (CBIR) and its applications.	1	2	16
4	Explain how Computer Vision is used in Virtual Reality and Multimedia.	1	2	16

UNIT 2

IMAGE REPRESENTATION AND ANALYSIS

Image representation, Image processing techniques like color and geometric transforms, Edge-detection Techniques, Filtering, Mathematical operations on image and its applications like convolution, filtering

Q.No	Question	CO	BTL	Marks
PART A				
1	What is Image Representation?	2	1	2
2	Define Geometric Transformation.	2	1	2
3	What is Convolution in Image Processing?	2	1	2
4	List two types of Image Filtering techniques.	2	2	2
5	What is the significance of Edge Detection?	2	1	2
6	Define Color Transformation in Image Processing.	2	1	2
7	How does Image Filtering help in noise reduction?	2	2	2
8	What is the role of Mathematical Operations in Image Processing.	2	1	2
PART B				
1	Explain different Image Processing techniques like Color Transformations, Geometric Transformations, and Filtering.	2	2	16
2	Describe various Edge Detection techniques with their mathematical representation.	2	2	16
3	Discuss the applications of Convolution and Filtering in Image Processing.	2	2	16
4	Explain how Mathematical Operations like Convolution and Filtering are used in real-world applications.	2	2	16

UNIT 3
MOTION ESTIMATION

Introduction to motion, Regularization theory, Optical computation, Stereo Vision, Motion estimation, Structure from motion and models

Q.No	Question	CO	BTL	Marks
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PART A

1	What is Motion Estimation?	3	1	2
2	Define Optical Flow.	3	1	2
3	What is Stereo Vision?	3	1	2
4	Differentiate between Motion Estimation and Structure from Motion.	3	2	2
5	What is Regularization Theory in Motion Estimation?	3	1	2
6	Mention the applications of Optical Computation in Motion Estimation.	3	1	2
7	How does Stereo Vision help in depth perception?	3	2	2
8	What is the importance of Structure from Motion?	3	1	2

PART B

1	Explain the concept of Motion Estimation and its role in Computer Vision.	3	2	16
2	Discuss Structure from Motion and Models with real-world applications.	3	2	16
3	Explain Optical Flow and Regularization Theory in Motion Estimation.	3	2	16
4	Describe Stereo Vision and its application in 3D reconstruction.	3	2	16

UNIT 4
TRANSFORMING REQUIREMENTS

Hough transforms and other simple object recognition methods, Shape correspondence and shape matching, Principal component analysis, Shape priors for recognition

Q.No	Question	CO	BTL	Marks
PART A				
1	What is the Hough Transform?	4	1	2
2	Define shape correspondence.	4	1	2
3	What is PCA (Principal Component Analysis) in object recognition?	4	1	2
4	Mention the advantages of shape priors in recognition.	4	2	2
5	How does shape matching help in object recognition?	4	1	2
6	What is the role of eigenfaces in face recognition?	4	1	2
7	Define active appearance models in object recognition.	4	2	2
8	What are the applications of object recognition in real-world scenarios?	4	1	2
PART B				
1	Explain Hough Transform and its applications in object recognition.	4	2	16
2	Discuss Principal Component Analysis (PCA) and its significance in object recognition.	4	2	16
3	Describe shape matching techniques and their role in object recognition.	4	2	16
4	Explain the concept of shape priors and their application in object recognition.	4	2	16

UNIT 5

APPLICATIONS

Photo album, Face detection, Face recognition, Eigenfaces, Active appearance and 3Dshape models of faces Application: Surveillance, foreground - background separation, particle filters, Chamfer matching, tracking, and occlusion, combining views from multiple cameras, human gait analysis Application: In vehicle vision system: locating roadway, road markings, identifying road signs, locating pedestrians

Q.No	Question	CO	BTL	Marks
PART A				
1	What is Eigenface in face recognition?	5	1	2
2	Define foreground-background separation.	5	1	2
3	What is particle filtering in tracking?	5	1	2
4	Mention two applications of human gait analysis.	5	2	2
5	How does an in-vehicle vision system work?	5	1	2
6	Define chamfer matching in object tracking.	5	1	2
7	What is occlusion in tracking?	5	2	2
8	Mention two applications of Computer Vision in road safety.	5	1	2
PART B				
1	Explain face detection and recognition techniques using Eigenfaces.	5	2	16
2	Discuss the role of Computer Vision in surveillance applications such as object tracking and occlusion handling.	5	2	16
3	Explain human gait analysis and its applications in security and healthcare.	5	2	16
4	Explain Vehicle vision system	5	2	16

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AIPPC204
DEEP LEARNING TECHNIQUES



UNIT I

INTRODUCTION

Introduction to machine learning- Linear models (SVMs and Perceptrons, logistic regression)- Intro to Neural Nets: What a shallow network computes- Training a network: loss functions, back propagation and stochastic gradient descent- Neural networks as universal function approximates.

Q.No	Question	CO	BTL	Marks
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PART A

1	Define Deep Learning.	1	1	2
2	What is a perceptron?	1	1	2
3	List two differences between shallow and deep networks.	1	1	2
4	What are loss functions in neural networks?	1	2	2
5	Define backpropagation.	1	1	2
6	What is stochastic gradient descent?	1	1	2
7	What do you mean by neural networks as universal function approximators?	1	2	2
8	What is the role of activation functions in neural networks?	1	1	2

PART B

1	Explain the role of machine learning in deep learning and compare SVMs, perceptrons, and logistic regression.	1	2	16
2	Describe the training process of a neural network with an example.	1	2	16
3	Explain backpropagation in detail along with its significance.	1	2	16
4	Discuss various types of loss functions used in neural networks.	1	2	16

UNIT 2

DEEP NETWORKS

History of Deep Learning- A Probabilistic Theory of Deep Learning- Backpropagation and regularization, batch normalization- VC Dimension and Neural Nets-Deep Vs Shallow Networks- Convolutional Networks- Generative Adversarial Networks (GAN), Semi-supervised Learning.

Q.No	Question	CO	BTL	Marks
PART A				
1	What is the difference between deep and shallow networks?	2	1	2
2	Define batch normalization.	2	1	2
3	What is VC dimension in deep learning?	2	1	2
4	List two advantages of generative adversarial networks (GANs).	2	2	2
5	Define convolutional networks.	2	1	2
6	What is regularization in neural networks?	2	1	2
7	Explain semi-supervised learning in brief.	2	2	2
8	What is the history of deep learning?	2	1	2
PART B				
1	Explain the probabilistic theory of deep learning.	2	2	16
2	Discuss the differences between deep networks and shallow networks with examples.	2	2	16
3	Explain convolutional neural networks (CNN) and their applications.	2	2	16
4	Describe the working and applications of generative adversarial networks (GANs).	2	2	16

UNIT 3

DIMENSIONALITY REDUCTION

Linear (PCA, LDA) and manifolds, metric learning - Auto encoders and dimensionality reduction in networks - Introduction to Convnet - Architectures – AlexNet, VGG, Inception, ResNet - Training a Convnet: weights initialization, batch normalization, hyperparameter optimization

Q.No	Question	CO	BTL	Marks
PART A				
1	Define dimensionality reduction.	3	1	2
2	What are autoencoders?	3	1	2
3	Explain metric learning in brief.	3	1	2
4	Define PCA and LDA.	3	2	2
5	What are manifolds in dimensionality reduction?	3	1	2
6	List two applications of convolutional neural networks.	3	1	2
7	What is hyperparameter optimization?	3	2	2
8	Name two architectures used in deep learning.	3	1	2
PART B				
1	Explain autoencoders and their role in dimensionality reduction.	3	2	16
2	Discuss principal component analysis (PCA) and linear discriminant analysis (LDA).	3	2	16
3	Describe the architecture and working of AlexNet and VGG.	3	2	16
4	Explain hyperparameter optimization techniques used in deep learning.	3	2	16

UNIT 4

OPTIMIZATION AND GENERALIZATION

Optimization in deep learning– Non-convex optimization for deep networks- Stochastic Optimization- Generalization in neural networks- Spatial Transformer Networks- Recurrent networks, LSTM - Recurrent Neural Network Language Models- Word-Level RNNs & Deep Reinforcement Learning - Computational & Artificial Neuroscience.

Q.No	Question	CO	BTL	Marks
PART A				
1	What is non-convex optimization?	4	1	2
2	Define stochastic optimization.	4	1	2
3	List two challenges in training deep neural networks.	4	1	2
4	What is generalization in neural networks?	4	2	2
5	Define LSTM.	4	1	2
6	What are recurrent neural networks (RNNs)?	4	1	2
7	Explain spatial transformer networks in brief.	4	2	2
8	What is computational neuroscience?	4	1	2
PART B				
1	Explain various optimization techniques used in deep learning.	4	2	16
2	Discuss recurrent neural networks (RNNs) and their applications.	4	2	16
3	Explain long short-term memory (LSTM) networks in detail.	4	2	16
4	Discuss generalization techniques in deep learning and their significance.	4	2	16

UNIT 5
CASE STUDY AND APPLICATIONS

Imagenet- Detection-Audio WaveNet-Natural Language Processing Word2Vec - Joint
Detection- BioInformatics- Face Recognition- Scene Understanding- Gathering Image Captions

Q.No	Question	CO	BTL	Marks
PART A				
1	What is WaveNet?	5	1	2
2	Define ImageNet.	5	1	2
3	Explain the role of deep learning in natural language processing.	5	1	2
4	What is object detection?	5	2	2
5	What are bioinformatics applications of deep learning?	5	1	2
6	Define face recognition.	5	1	2
7	What is scene understanding in deep learning?	5	2	2
8	Mention two use cases of deep learning in real-world applications.	5	1	2
PART B				
1	Explain deep learning applications in image recognition.	5	2	16
2	Discuss the role of deep learning in bioinformatics.	5	2	16
3	Explain WaveNet and its applications in speech synthesis.	5	2	16
4	Discuss deep learning techniques for face recognition and scene understanding.	5	2	16

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24CSPPE209
HIGH PERFORMANCE COMPUTING FOR BIG DATA



UNIT 1

INTRODUCTION

The Emerging IT Trends- IOT/IOE-Apache Hadoop for big data analytics-Big data into big insights and actions – Emergence of BDA discipline – strategic implications of big data – BDA Challenges – HPC paradigms – Cluster computing – Grid Computing – Cloud computing – Heterogeneous computing – Mainframes for HPC - Supercomputing for BDA – Appliances for BDA.

Q.No	Question	CO	BTL	Marks
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PART A

1	Define Big Data.	1	1	2
2	Define IOE.	1	1	2
3	Distinguish Cluster and Grid Computing.	1	2	2
4	Write the applications of BDA.	1	1	2
5	Define Apache Hadoop and its role in big data analytics.	1	1	2
6	How does Big Data Analytics (BDA) provide strategic business insights?	1	2	2
7	How does heterogeneous computing enhance high-performance computing (HPC)?	1	2	2
8	What is cluster computing?	1	1	2

PART B

1	Explain working of the following phases of Map Reduce with one common example (i) Map Phase, (ii) Shuffle and sort phase, and (iii) Reducer Phase	1	3	16
2	Illustrate in detail about grid computing and Cluster computing.	1	5	16
3	Explain in detail about the main frames of HPC with suitable example.	1	5	16
4	Write in detail about the real time applications of Big data Analytics.	1	3	16

UNIT II
NETWORK & SOFTWARE INFRASTRUCTURE FOR HIGH
PERFORMANCE BDA

Design of Network Infrastructure for high performance BDA – Network Virtualization – Software Defined Networking – Network Functions Virtualization – WAN optimization for transfer of big data – started with SANs- storage infrastructure requirements for storing big data – FC SAN – IP SAN – NAS – GFS – Panasas – Luster file system – Introduction to cloud storage.

Q.No	Question	CO	BTL	Marks
PART A				
1	Write short notes on Network Functions Virtualization	2	2	2
2	Define SAN. List out some advantages of SAN.	2	1	2
3	Differentiate FC SAN and IP SAN	2	1	2
4	What is Luster file System?	2	2	2
5	What is the role of WAN optimization in big data transfer?	2	1	2
6	How does NAS differ from SAN in big data storage?	2	1	2
7	Compare GFS and Panasas in terms of big data storage performance.	2	2	2
8	How does Luster File System enhance high-performance data storage?	2	2	2
PART B				
1	Discuss about the storage infrastructure requirements for storing big data.	2	4	16
2	Generalize the following in detail. (i) Google Bigtable Datastore (ii) Mobile Me.	2	5	16
3	Explain about the Network function virtualization for high performance for big data	2	5	16
4	Find the different file systems used in cloud environment and Explain in detail about the file systems used GFS and Amazon S3	2	5	16

UNIT III

REAL TIME ANALYTICS USING HIGH PERFORMANCE COMPUTING

Technologies that support Real time analytics – MOA: Massive online analysis – GPFS: General parallel file system – Client case studies – Key distinctions – Machine data analytics – operational analytics – HPC Architecture models – In Database analytics – In memory analytics

Q.No	Question	CO	BTL	Marks
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PART A

1	State Massive Online Analysis.	3	2	2
2	Outline the challenges in implementing HPC Architecture	3	2	2
3	What is real-time analytics?	3	1	2
4	What is GPFS (General Parallel File System)?	3	1	2
5	Define In-Database Analytics	3	1	2
6	Give an example of a real-world application of in-memory analytics.	3	2	2
7	What are the key distinctions between traditional analytics and real-time analytics?	3	1	2
8	How does HPC architecture support real-time analytics?	3	2	2

PART B

1	You are required to make a case study on STOCK MARKET PREDICTION with following requirements: (i) Briefly introduce about Stock market and its prediction (ii) The Solution Path of the stock Market Prediction. (iii) Do the Empirical Study of the Stock Market Prediction.	3	4	16
2	Discuss in detail about (i)Tabulate the short notes on GPFS (ii)Compare and contrast- In Database analytics–In memory analytics.	3	3	16
3	Describe Massive Online Analysis (MOA) and its role in real time big data processing. How does it compare with traditional analytics models?	3	4	16
4	Explain High-Performance Computing (HPC) architecture models and their role in real-time analytics. Discuss how they help in processing big data efficiently.	3	5	16

UNIT IV

SECURITY AND TECHNOLOGIES

Security, Privacy and Trust for user – generated content: The challenges and solutions – Role of real time big data processing in the IoT – End to End Security Framework for big sensing data streams – Clustering in big data.

Q.No	Question	CO	BTL	Marks
PART A				
1	What are the key challenges in ensuring security for user generated content?	4	1	2
2	Define real-time big data processing.	4	1	2
3	What is an end-to-end security framework?	4	1	2
4	What is clustering in big data	4	1	2
5	Give an example of a security solution for protecting big data streams.	4	2	2
6	How is clustering used for analyzing big data in IoT?	4	1	2
7	Compare different security challenges in user-generated content.	4	2	2
8	What are the advantages and disadvantages of clustering in big data?	4	1	2
PART B				
1	Discuss the security, privacy, and trust issues related to user generated content. What are the key challenges and solutions in managing secure content?	4	4	16
2	Provide examples of IoT applications using real-time data processing.	4	3	16
3	Explain the importance of security in data streams and discuss the techniques used to secure data from collection to storage and analysis	4	5	16
4	Explain the risks and threats associated with big data analytics. How do organizations address these challenges in real-time big data applications?	4	5	16

UNIT V
EMERGING BIG DATA APPLICATIONS

Deep learning Accelerators – Accelerators for clustering applications in machine learning - Accelerators for classification algorithms in machine learning – Accelerators for Big data Genome Sequencing

Q.No	Question	CO	BTL	Marks
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PART A

1	What are deep learning accelerators?	5	1	2
2	Define clustering in machine learning.	5	1	2
3	What is a classification algorithm in machine learning?	5	2	2
4	What is genome sequencing in big data analytics?	5	1	2
5	Compare CPUs, GPUs, and TPUs in deep learning acceleration.	5	2	2
6	What are the challenges in accelerating big data genome sequencing?	5	1	2
7	How can TPUs improve deep learning performance?	5	2	2
8	How do accelerators enhance clustering applications?	5	1	2

PART B

1	Explain deep learning accelerators and their role in high performance computing. Compare different accelerators such as GPUs, TPUs, and FPGAs used in deep learning.	5	2	16
2	Discuss the role of accelerators in clustering applications in machine learning. How do they improve the efficiency of clustering algorithms?	5	4	16
3	Explain the use of accelerators in classification algorithms. Discuss different accelerators and their impact on the accuracy and speed of classification tasks.	5	5	16
4	Compare different accelerators used for machine learning applications, including clustering, classification, and genome sequencing. Discuss their advantages and limitations	5	4	16

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24AIPPE205
VIDEO ANALYTICS

UNIT I
INTRODUCTION TO BIG DATA & DATA ANALYSIS

Introduction to Big Data Platform – Challenges of Conventional systems – Web data- Evolution of Analytic scalability- analytic processes and tools- Analysis Vs Reporting- Modern data analytic tools- Data Analysis: Regression Modeling- Bayesian Modeling- Rule induction.

Q.No	Question	CO	BTL	Marks
PART A				
1.	Define Big Data platform.	CO1	RE	2
2.	Recall challenges of conventional systems.	CO1	RE	2
3.	Identify features of web data.	CO1	RE	2
4.	Differentiate analysis and reporting.	CO1	UN	2
5.	Outline analytic scalability.	CO1	UN	2
6.	Compare structured and unstructured data.	CO1	UN	2
7.	Name modern analytic tools.	CO1	RE	2
8.	Classify types of regression models.	CO1	UN	2
PART B				
1.	Compare Big Data platforms with conventional systems.	CO1	UN	16
2.	Analyze analytic process lifecycle.	CO1	AN	16
3.	Illustrate modern data analytic tools with architecture.	CO1	UN	16
4.	Apply regression modeling to a dataset scenario.	CO1	AP	16

MINING DATA STREAMS

Introduction to Stream concepts- Stream data model and architecture – Stream Computing- Sampling data in a Stream- Filtering Streams- Counting distinct elements in a Stream- Estimating moments- Counting oneness in a window- Decaying window- Real time Analytics platform(RTAP) applications- case studies.

Q.No	Question	CO	BTL	Marks
PART A				
1.	Specify the stream data model.	CO2	RE	2
2.	List stream architecture components.	CO2	RE	2
3.	State objectives of stream computing.	CO2	RE	2
4.	Distinguish sampling from filtering.	CO2	UN	2
5.	Organize steps in counting distinct elements.	CO2	UN	2
6.	Describe moment estimation.	CO2	UN	2
7.	Tabulate window models.	CO2	UN	2
8.	Relate decaying window with time-based models.	CO2	UN	2
PART B				
1.	Construct stream processing architecture diagram.	CO2	AP	16
2.	Execute sampling techniques for continuous streams.	CO2	AP	16
3.	Investigate distinct counting algorithms.	CO2	AN	16
4.	Develop a decaying window model for stream data.	CO2	AP	16

UNIT III
VIDEO ANALYTICS

Introduction- Video Basics - Fundamentals for Video Surveillance- Scene Artifacts- Object Detection and Tracking: Adaptive Background Modelling and Subtraction- Pedestrian Detection and Tracking-Vehicle Detection and Tracking- Articulated Human Motion Tracking in Low-Dimensional Latent Spaces.

Q.No	Question	CO	BTL	Marks
PART A				
1.	Label elements of video basics.	CO3	RE	2
2.	Point out components of video surveillance.	CO3	RE	2
3.	Recognize types of scene artifacts.	CO3	RE	2
4.	Categorize object detection techniques.	CO3	UN	2
5.	Break down steps in adaptive background modelling.	CO3	UN	2
6.	State purpose of background subtraction.	CO3	RE	2
7.	Clarify pedestrian tracking logic.	CO3	UN	2
8.	Indicate vehicle detection methods.	CO3	UN	2
PART B				
1.	Formulate surveillance system workflow.	CO3	AP	16
2.	Assess scene artifacts influence on detection.	CO3	AN	16
3.	Integrate object tracking methods in dynamic scenes.	CO3	AP	16
4.	Implement adaptive background subtraction algorithm.	CO3	AP	16

UNIT IV
BEHAVIOURAL ANALYSIS & ACTIVITY RECOGNITION

Event Modelling- Behavioural Analysis- Human Activity Recognition-Complex Activity Recognition- Activity modelling using 3D shape, Video summarization, shape based activity models- Suspicious Activity Detection.

Q.No	Question	CO	BTL	Marks
PART A				
1.	What is event modelling ?	CO4	RE	2
2.	Give examples of behavioural patterns.	CO4	RE	2
3.	Identify human activity types.	CO4	RE	2
4.	State meaning of complex activity recognition.	CO4	RE	2
5.	Contrast simple and complex activities.	CO4	UN	2
6.	Map 3D shape modelling steps.	CO4	UN	2
7.	Relate video summarization with activity extraction.	CO4	UN	2
8.	Show classification of activity models.	CO4	UN	2
PART B				
1.	Design event modelling framework for surveillance.	CO4	AP	16
2.	Analyze human activity recognition techniques used in video analytics.	CO4	AN	16
3.	Organize complex activity recognition pipeline.	CO4	AP	16
4.	Differentiate statistical and shape-based activity models.	CO4	UN	16

UNIT V
HUMAN FACE RECOGNITION & GAIT ANALYSIS

Introduction: Overview of Recognition algorithms – Human Recognition using Face: Face Recognition from still images, Face Recognition from video, Evaluation of Face Recognition Technologies- Human Recognition using gait: HMM Framework for Gait Recognition, View Invariant Gait Recognition, Role of Shape and Dynamics in Gait Recognition.

Q.No	Question	CO	BTL	Marks
PART A				
1.	What is biometric recognition?	CO5	RE	2
2.	Identify face recognition techniques.	CO5	RE	2
3.	Name evaluation metrics.	CO5	RE	2
4.	Select suitable face recognition algorithm.	CO5	UN	2
5.	State HMM framework concept.	CO5	RE	2
6.	Match face and gait recognition features.	CO5	UN	2
7.	Rearrange gait cycle phases.	CO5	UN	2
8.	Outline view invariant gait recognition.	CO5	UN	2
PART B				
1.	Compose workflow of face recognition system.	CO5	AP	16
2.	Test face recognition techniques on video data.	CO5	AP	16
3.	Diagnose performance limitations in biometric systems.	CO5	AN	16
4.	Compare gait and face recognition frameworks.	CO5	UN	16

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24CSPACX02
DISASTER MANAGEMENT



UNIT I INTRODUCTION

Disaster: Definition, Factors and Significance; Difference between Hazard And Disaster; Natural and Manmade Disasters: Difference, Nature, Types and Magnitude.

Q.No	Question	CO	BTL	Marks
PART A				
1.	What is a disaster?	1	1	2
2.	Define hazard.	1	1	2
3.	What is the difference between a hazard and a disaster?	1	1	2
4.	What are the factors contributing to a disaster?	1	1	2
5.	What is the difference between natural and manmade disasters?	1	1	2
6.	Name two types of manmade disasters.	1	2	2
7.	How is the magnitude of a disaster measured?	1	2	2
8.	How can manmade disasters be prevented?	1	1	2
PART B				
1.	Disaster: Definition, Factors, and Significance	1	2	16
2.	Difference between Hazard and Disaste	1	4	16
3.	Natural and Man-made Disasters: Difference, Nature, Types, and Magnitude	1	5	16
4.	Explain factors contributing to a disaster and magnitude of a disaster measured	1	5	16

UNIT II
REPERCUSSIONS OF DISASTERS AND HAZARDS

Economic Damage, Loss of Human and Animal Life, Destruction Of Ecosystem. Natural Disasters: Earthquakes, Volcanisms, Cyclones, Tsunamis, Floods, Droughts And Famines, Landslides And Avalanches, Man-made disaster: Nuclear Reactor Meltdown, Industrial Accidents, Oil Slicks And Spills, Outbreaks Of Disease And Epidemics, War And Conflicts.

Q.No	Question	CO	BTL	Marks
PART A				
1.	What are the primary effects of earthquakes on the environment?	2	1	2
2.	How do tsunamis affect coastal ecosystems?	2	1	2
3.	Mention two major consequences of volcanic eruptions.	2	2	2
4.	What is the impact of cyclones on human settlements?	2	1	2
5.	What are the economic consequences of droughts and famines?	2	1	2
6.	Explain how landslides can lead to destruction of infrastructure.	2	2	2
7.	How do avalanches affect both human life and the environment?	2	2	2
8.	How do earthquakes lead to the loss of human and animal life?	2	2	2
PART B				
1.	Natural Disasters	2	4	16
2.	Man-Made Disasters	2	4	16
3.	Explain i) Main economic damages caused by natural disasters ii) impact of cyclones on human settlements	2	2	16
4.	Describe i) major consequences of volcanic eruptions. ii) primary effects of earthquakes on the environment.	2	1	16

UNIT III
DISASTER PRONE AREAS IN INDIA

Study of Seismic Zones; Areas Prone To Floods and Droughts, Landslides And Avalanches; Areas Prone To Cyclonic and Coastal Hazards with Special Reference To Tsunami; Post-Disaster Diseases and Epidemics

Q.No	Question	CO	BTL	Marks
PART A				
1.	What is the primary cause of earthquakes in seismic zones?	3	2	2
2.	How does deforestation contribute to floods?	3	2	2
3.	What is the primary cause of droughts in semi-arid regions?	3	1	2
4.	What is an avalanche?	3	1	2
5.	Define a tsunami.	3	1	2
6.	What is the role of vaccines in controlling post-disaster epidemics?	3	1	2
7.	Name one disease commonly seen after a major flood.	3	2	2
8.	How can coastal areas prepare for cyclones and tsunamis?	3	2	2
PART B				
1.	i) Explain the concept of seismic zones in India. ii) Discuss the factors responsible for the distribution of these zones and their significance in disaster preparedness and mitigation.	3	5	16
2.	Describe the factors that contribute to floods and droughts in India. How can early warning systems and proper management of water resources mitigate the impact of these disasters?	3	5	16
3.	What are the primary causes of landslides and avalanches?	3	4	16
4.	How can governments and organizations plan and respond to such outbreaks following major disasters?	3	4	16

UNIT IV
DISASTER PREPAREDNESS AND MANAGEMENT

Symbolic Synthesis for CPS- Security in CPS-Synchronization of CPS-Real-Time Scheduling forCPS

Q.No	Question	CO	BTL	Marks
PART A				
1.	What is symbolic synthesis in the context of Cyber-Physical Systems (CPS)?	4	1	2
2.	How does synchronization play a role in CPS?	4	1	2
3.	What is real-time scheduling in the context of CPS, and why is it important?	4	1	2
4.	Explain the importance of CPS synchronization for real-time scheduling in safety-critical systems.	4	2	2
5.	What is the primary challenge in real-time scheduling for CPS?	4	2	2
6.	What are the benefits of symbolic synthesis in CPS security?	4	1	2
7.	What is the role of feedback in the synchronization of CPS?	4	1	2
8.	How can real-time scheduling be optimized for energy efficiency in CPS?	4	2	2
PART B				
1.	Symbolic Synthesis Overview	4	5	16
2.	Application in CPS Security	4	4	16
3.	CPS Synchronization and Real-Time Scheduling	4	4	16
4.	Formal Methods for Synthesis	4	5	16

UNIT V
RISK ASSESSMENT

Disaster Risk: Concept and Elements, Disaster Risk Reduction, Global and National Disaster Risk Situation. Techniques of Risk Assessment, Global Co-Operation in Risk Assessment and Warning, People's Participation in Risk Assessment. Strategies for Survival

Q.No	Question	CO	BTL	Marks
PART A				
1.	What is disaster risk?	5	1	2
2.	Give an example of a measure used in disaster risk reduction	5	2	2
3.	Mention one global organization involved in disaster risk management.	5	2	2
4.	What role do historical data play in risk assessment?	5	1	2
5.	Why is international cooperation essential in disaster risk management?	5	1	2
6.	Why is public participation important in risk assessment?	5	1	2
7.	Mention one strategy for survival during a natural disaster	5	2	2
8.	What is the role of evacuation plans in survival strategies during disasters?	5	1	2
PART B				
1.	Explain Disaster Risk: Concept and Elements	5	5	16
2.	Global and National Disaster Risk Situation	5	5	16
3.	Global Co-operation in Risk Assessment and Warning	5	5	16
4.	Strategies for Survival	5	4	16

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