



|| Jai Sri Gurudev ||



BGSKH Education Trust(R.) - A unit of Sri Adichunchanagiri Shikshana Trust(R.)
BGS College Of Engineering and Technology

Mahalakshmpuram, Bengaluru – 560 086

(Approved by AICET – New Delhi, Affiliated to VTU, Belagavi)



VTU – VI Sem Question Papers. June/July - 2025

2022 - Scheme





(Jai Sri Gurudev)
BGS&H Education Trust (P) - A unit of Sri Adithyanagiri Shiksha Trust (P)
BGS College of Engineering and Technology
Mahalakshmiapuram, West of Chord Road, Bengaluru-560086
(Approved by AICTE, New Delhi and Affiliated to VTU, Belagavi)

VI Semester Question Papers June/July - 2025

<u>Sl.No</u>	<u>Name of the Subject</u>	<u>Subject Code</u>
1	Natural Language Processing	BA1601
2	Big Data Analytics	BAD601/BDS601
3	Full Stack Development	BIS601
4	Design Processes and Perspectives	BCG602
5	Machine Learning	BCS602
6	Machine Learning - I	BAI602
7	Natural Language Processing	BAD613B
8	Advanced Java	BCS613D
9	Cloud Computing and Security	BIS613D
10	Renewable Energy Power Plants	BME654B



CBCS SCHEME

USN

--	--	--	--	--	--	--	--	--	--

BAI601

Sixth Semester B.E./B.Tech. Degree Examination, June/July 2025

Natural Language Processing

Time: 3 hrs.

Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. M : Marks, L: Bloom's level, C: Course outcomes.

Module – 1				M	L	C
Q.1	a.	Illustrate with suitable examples the different levels in Natural Language Processing.		08	L2	CO1
	b.	Explain the challenges of Natural Language Processing.		06	L2	CO1
	c.	Briefly explain Karaka Theory		06	L2	CO1
OR						
Q.2	a.	Illustrate different forms of knowledge required in language processing.		06	L2	CO1
	b.	Write the applications of Natural Language Processing.		06	L2	CO1
	c.	List the problems associated with N-gram Model. Explain how these problems are handled.		08	L2	CO1
Module – 2						
Q.3	a.	Explain the working of Morphological Parsing.		06	L2	CO2
	b.	Write CYK Algorithm for context Free Grammar.		06	L3	CO2
	c.	For the given context Free Grammar (CFG) S → AB/BC A → BA/a B → CC/b C → AB/a Check whether the string (w) = 'ababa' is valid or not.		08	L3	CO2
OR						
Q.4	a.	Explain Top-down and Bottom-up Parsing with example.		08	L1	CO2
	b.	List out disadvantages of Context Free Grammar in Natural Language Grammar		04	L1	CO2
	c.	Illustrate spelling Error Detection and Correction in word level analysis.		08	L2	CO2
1 of 2						



Module – 3

Q.5	a.	Explain working of Naïve Bayes Algorithm.	07	L2	CO3																																													
	b.	Suppose you have a dataset of 'Weather Conditions' and corresponding target variable 'Play' given below: <table><tr><td>Sl.No.</td><td>Outlook</td><td>Play</td></tr><tr><td>1</td><td>Rainy</td><td>Yes</td></tr><tr><td>2</td><td>Sunny</td><td>Yes</td></tr><tr><td>3</td><td>Overcast</td><td>Yes</td></tr><tr><td>4</td><td>Overcast</td><td>Yes</td></tr><tr><td>5</td><td>Sunny</td><td>No</td></tr><tr><td>6</td><td>Rainy</td><td>Yes</td></tr><tr><td>7</td><td>Sunny</td><td>Yes</td></tr><tr><td>8</td><td>Overcast</td><td>Yes</td></tr><tr><td>9</td><td>Rainy</td><td>No</td></tr><tr><td>10</td><td>Sunny</td><td>No</td></tr><tr><td>11</td><td>Sunny</td><td>Yes</td></tr><tr><td>12</td><td>Rainy</td><td>No</td></tr><tr><td>13</td><td>Overcast</td><td>Yes</td></tr><tr><td>14</td><td>Overcast</td><td>Yes</td></tr></table> Using above dataset, decide Whether you should play or not on a particular day with weather is 'Sunny' by applying Bayes Theorem.	Sl.No.	Outlook	Play	1	Rainy	Yes	2	Sunny	Yes	3	Overcast	Yes	4	Overcast	Yes	5	Sunny	No	6	Rainy	Yes	7	Sunny	Yes	8	Overcast	Yes	9	Rainy	No	10	Sunny	No	11	Sunny	Yes	12	Rainy	No	13	Overcast	Yes	14	Overcast	Yes	08	L3	CO3
Sl.No.	Outlook	Play																																																
1	Rainy	Yes																																																
2	Sunny	Yes																																																
3	Overcast	Yes																																																
4	Overcast	Yes																																																
5	Sunny	No																																																
6	Rainy	Yes																																																
7	Sunny	Yes																																																
8	Overcast	Yes																																																
9	Rainy	No																																																
10	Sunny	No																																																
11	Sunny	Yes																																																
12	Rainy	No																																																
13	Overcast	Yes																																																
14	Overcast	Yes																																																
	c.	Write applications of Naïve Bayes classifier.	05	L2	CO3																																													

OR

Q.6	a.	Illustrate optimizing for sentiment analysis.	10	L2	CO3
	b.	How can you use Naïve Bayes for a variety of text classification tasks?	06	L1	CO3
	c.	Explain different types Language Model using Naïve Bayes.	04	L2	CO3

Module – 4

Q.7	a.	Explain design features of information retrieval system.	10	L2	CO4
	b.	Mention major issues in Information Retrieval.	05	L2	CO4
	c.	How stemming affects, the performance of IR Systems?	05	L1	CO4

OR

Q.8	a.	Explain wordnet and list the applications of wordnet.	08	L2	CO4
	b.	Illustrate the LSTM Model.	08	L2	CO4
	c.	Explain the use of Fuzzy Model in Information Retrieval.	04	L2	CO4

Module – 5

Q.9	a.	Illustrate details of the Encoder – Decoder Model in Machine Translation (MT).	12	L2	CO5
	b.	Explain Lexical Divergences in MT.	08	L2	CO5

OR

Q.10	a.	Explain automatic evaluation in various forms. List out ethical issues raised in Machine Translation	12	L2	CO5
	b.	Explain the approaches for dealing with low-resource situations in MT.	08	L2	CO5

CBCS SCHEME

USN

--	--	--	--	--	--	--	--	--	--

BAD601/BDS601

Sixth Semester B.E./B.Tech. Degree Examination, June/July 2025

Big Data Analytics

Time: 3 hrs.

Max. Marks: 100

*Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. M: Marks, L: Bloom's level, C: Course outcomes.*

Module – 1				M	L	C
Q.1	a.	Explain classification of Big Data with a diagram.		10	L2	CO1
	b.	Define Big Data explain its characteristics and challenges.		10	L1	CO1
OR						
Q.2	a.	What is NoSQL? Explain different types of NoSQL database with an example.		10	L1	CO1
	b.	Explain shared nothing architecture, CAP theorem and list its advantages.		10	L2	CO1
Module – 2						
Q.3	a.	Differentiate between. i. RDBMS and Hadoop ii. Mapper and Reducer		10	L2	CO2
	b.	Identify and explain key aspects and components of Hadoop.		10	L3	CO2
OR						
Q.4	a.	Explain Hadoop distributed File System (HDFS) with a diagram.		10	L2	CO2
	b.	Identify and explain different phase of map task and reduce task for the word count problem.		10	L3	CO2
Module – 3						
Q.5	a.	What is CRUD operation in Mongo DB? Explain the following commands. i. Insert method ii. Update on array iii. Save method		10	L1	CO3
	b.	Determine and explain the characteristics of Mongo DB.		10	L3	CO3
OR						
Q.6	a.	Write short notes on. i. Aggregate function ii. Map reduce function in Mongo DB		10	L2	CO2
	b.	Determine and explain creation of database, dropping of database and datatypes of Mongo DB.		10	L3	CO2
Module – 4						
Q.7	a.	Define Hive. Explain its main task and features.		10	L1	CO4
	b.	Analyze Hive architecture with its diagram.		10	L4	CO4
OR						
Q.8	a.	Define Pig. Explain its feature, anatomy and philosophy.		10	L1	CO4
	b.	Examine identifiers, keywords, data types and operators of Pig with an example.		10	L4	CO4
Module – 5						
Q.9	a.	Analyze spark SQL and Pandas for data analysis.		10	L4	CO4
	b.	Determine and explain component, features of spark architecture.		10	L3	CO5
OR						
Q.10	a.	Analyze different phase of text mining process with a diagram.		10	L4	CO5
	b.	Identify and explain preprocessing steps, mining task for web content.		10	L3	CO5



CBCS SCHEME

BIS601

USN

--	--	--	--	--	--	--	--	--	--

Sixth Semester B.E./B.Tech. Degree Examination, June/July 2025 Full Stack Development

Time: 3 hrs.

Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. M : Marks, L: Bloom's level, C: Course outcomes.

Module – 1				M	L	C
Q.1	a.	Explain the difference between var, let and const with suitable examples.		5	L2	CO1
	b.	Describe the various data types in JavaScript. Give examples for each.		5	L2	CO1
	c.	Write a program that creates an array of 5 cities and performs the following: i) Adds a city at the end ii) Removes the first city iii) Logs the total numbers of cities iv) Finds the index of a special city v) Search for a specific city vi) Replace specific city with another		10	L3	CO1
OR						
Q.2	a.	Create a JavaScript object named student with properties: name, grade and subjects. Add a method displayInfo() to log student details.		5	L3	CO1
	b.	Explain the structure of a JavaScript function. How are parameters and return values used?		5	L2	CO1
	c.	Explain the usage of at least five different string methods in JavaScript with the help of suitable code snippets.		10	L2	CO1
Module – 2						
Q.3	a.	What is the Document Object Model (DOM)? Explain its significance in web development.		5	L2	CO2
	b.	Explain event delegation and how it helps improve performance in DOM manipulation.		5	L2	CO2
	c.	Explain any six different DOM method used to access or manipulate HTML elements in JavaScript, including their syntax, use cases and when each is preferred.		10	L2	CO2
OR						
Q.4	a.	How can you select HTML elements using JavaScript? List and explain at least three methods.		5	L2	CO2
	b.	What are event listeners in JavaScript? How do they differ from traditional event attributes (like onclick) for binding events?		5	L2	CO2
1 of 3						



BIS601					
	c.	Create a button in your HTML with the text "Click Me". Add an event listener to log "Button clicked!", to the console when the button is clicked. Select an image and add a mouseover event listener to change its border color. Add an event listener to the document that logs the key pressed by the user.	10	L3	CO2
Module – 3					
Q.5	a.	Explain the components of the MERN stack and discuss how they interact in a full stack application. Highlight the role of each component with examples.	10	L2	CO3
	b.	Describe how to implement a simple REST API using express to return a list of issues. Include an explanation of routing, request handling and how JSON data is sent as a response.	10	L3	CO3
OR					
Q.6	a.	Discuss how react uses JSX for rendering UI components. What are the benefits of using JSX over plain JavaScript in react applications?	10	L3	CO3
	b.	Describe the steps involved in creating a react components using ES6 class syntax. What are the essential life cycle methods used in such a component?	10	L3	CO3
Module – 4					
Q.7	a.	Explain how state is initialized and update in a react class component. Illustrate with an example from the issue tracker application.	10	L2	CO4
	b.	Discuss how event handling is implemented in react. How does it differ from traditional DOM event handling in vanilla JavaScript?	10	L3	CO4
OR					
Q.8	a.	Differentiate between stateless and stateful components in react. When should each be used in a component – based architecture?	10	L2	CO4
	b.	Write a react class component that displays a button and a counter. Each time the button is clicked, increase the count and display it. Use constructor to initialize state and setState() to update it.	10	L3	CO4
Module – 5					
Q.9	a.	Discuss the key differences between insert, update and find operations in MongoDB. How does MongoDB handle flexible schema and embedded documents?	10	L2	CO5
	b.	Create a simple webpack.config.js file that: i) Bundles on entry point file App.jsx ii) Uses babel – loader to transpile JSX iii) Outputs app.bundle.js in a static directory. iv) Uses ES6 presets for react.	10	L3	CO5
2 of 3					

BIS601				
OR				
Q.10	a.	Write Mongo shell commands to perform the following operations: • Insert three employee documents with different fields. • Update one document to add a middle name. • Delete one document by-id • Create an index on the age field • Query employees whose age is greater than 30.	10	L3 CO5
	b.	Explain the purpose of using webpack in a full stack project. Describe how webpack helps in modularization and bundling.	10	L2 CO5



CBCS SCHEME

BCG602

USN

--	--	--	--	--	--	--	--	--	--

Sixth Semester B.E./B.Tech. Degree Examination, June/July 2025 Design Processes and Perspectives

Time: 3 hrs.

Max. Marks: 100

*Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. M : Marks , L: Bloom's level , C: Course outcomes.*

Module – 1			M	L	C
Q.1	a.	Explain how the simplified iteration model helps in refining a design. Why is iteration a fundamental aspect of design methodology?	4	L2	CO1
	b.	Compare the design method with the scientific method with a neat diagram to develop a solution for lack of access to clean drinking water in rural communities.	8	L3	CO1
	c.	Explain the problem solving methodology in engineering design process.	8	L2	CO1
OR					
Q.2	a.	Explain the different types of engineering design with example.	4	L2	CO1
	b.	What are the key challenges in accurately identifying design needs? Identify the steps core need behind designing a problem of inaccurate heart rate monitoring in wearable devices.	8	L3	CO1
	c.	What are the societal, environmental and ethical consideration for a company planning to launch a budget – friendly smart phone for developing nations.	8	L2	CO1
Module – 2					
Q.3	a.	Define data, information and knowledge with examples.	4	L2	CO2
	b.	Design a product architecture of a smart home system and outline key steps involved.	8	L3	CO2
	c.	A company is developing a new electric vehicle. The design team needs to gather relevant information for material selection and battery efficiency: i) Identify and explain three reliable sources to be used. ii) Describe how to verify the credibility of the collected information.	8	L2	CO2
OR					
Q.4	a.	List and define the factors that help transform, data into meaningful information.	4	L2	CO2
	b.	Compare and contrast modular and integral product architecture. Discuss their advantages and disadvantages with real world examples.	8	L3	CO2
	c.	Explain the different types of sources available for gathering design information and their significance.	8	L2	CO2



BCG602					
Module – 3					
Q.5	a.	What is brainstorming? Explain its role in idea generation.	4	L2	CO3
	b.	Explain the behavioral aspects of decision making in detail.	8	L2	CO3
	c.	Apply quick idea generation tool like six key questions, five whys to generate innovative ideas for developing eco-friendly packaging material for product development company.	8	L3	CO3
OR					
Q.6	a.	What is SCAMPER method explain?	4	L2	CO3
	b.	Apply decision making process to select the best material for packaging in a sustainable product.	8	L3	CO3
	c.	Explain in detail the process of design selection based on judgment and experience.	8	L2	CO3
Module – 4					
Q.7	a.	Describe the principles of reducing users memory load in UI design.	4	L2	CO4
	b.	What is design pattern? Explain its structure with an example.	8	L2	CO4
	c.	Analyze how user interface design steps is implemented for a social media web App.	8	L3	CO4
OR					
Q.8	a.	List and explain any 4 kinds of design patterns.	4	L2	CO4
	b.	Explain the interface design steps and apply the same to the user scenario for the safe home system.	8	L3	CO4
	c.	Explain user interface web App design patterns.	8	L2	CO4
Module – 5					
Q.9	a.	Explain how ecosystems can be modeled in engineering terms.	4	L2	CO5
	b.	Discuss the reasons for reducing dependence on fossil fuels.	8	L2	CO5
	c.	Evaluate the challenges faced by global businesses in adhering to environmental regulations.	8	L3	CO5
OR					
Q.10	a.	What does CSR stand for, explain CSR measures used to evaluate corporate sustainability performance.	4	L2	CO5
	b.	What are option available at a product EO life. Evaluate the use of combustion as a waste management strategy. What are its benefits and drawbacks?	8	L3	CO5
	c.	Explain how fossil fuel dependencies has evolved since the 1970s.	8	L2	CO5

CBCS SCHEME

BCS602

USN

--	--	--	--	--	--	--	--	--	--

Sixth Semester B.E./B.Tech. Degree Examination, June/July 2025 Machine Learning

Time: 3 hrs.

Max. Marks: 100

*Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. M : Marks , L: Bloom's level , C: Course outcomes.*

Module – 1				M	L	C																														
Q.1	a.	State Tom Mitchell's definition of machine learning. List and explain the challenges of machine learning.		7	L1	CO1																														
	b.	List and explain the visualization aids available for univariate data analysis with example for each.		7	L2	CO1																														
	c.	For the patients age, list {12, 14, 19, 22, 24, 26, 28, 31, 34}. Find the IQR.		6	L3	CO1																														
OR																																				
Q.2	a.	Explain in detail the machine learning process with a neat diagram.		7	L2	CO1																														
	b.	Explain data preprocessing with measures to solve the problem of missing data.		7	L2	CO1																														
	c.	Find the 5-point summary of the list {13, 11, 2, 3, 4, 8, 9} and plot the box plot for the same.		6	L3	CO1																														
Module – 2																																				
Q.3	a.	Let the data points be $\begin{pmatrix} 2 \\ 6 \end{pmatrix}$ and $\begin{pmatrix} 1 \\ 7 \end{pmatrix}$. Apply Principal Component Analysis (PCA) and find the transformed data.		10	L3	CO1																														
	b.	Apply candidate elimination algorithm on the dataset given in Table Q.3(b) to obtain the complete version space. Table Q.3(b)		10	L3	CO2																														
<table border="1" style="width: 100%; text-align: center;"><tr><th>CGPA</th><th>Interactiveness</th><th>Practical knowledge</th><th>Communication skills</th><th>Logical thinking</th><th>Job offer</th></tr><tr><td>≥ 9</td><td>Yes</td><td>Excellent</td><td>Good</td><td>Fast</td><td>YES</td></tr><tr><td>≥ 9</td><td>Yes</td><td>Good</td><td>Good</td><td>Fast</td><td>YES</td></tr><tr><td>≥ 8</td><td>No</td><td>Good</td><td>Good</td><td>Fast</td><td>NO</td></tr><tr><td>≥ 9</td><td>Yes</td><td>Good</td><td>Good</td><td>Slow</td><td>YES</td></tr></table>							CGPA	Interactiveness	Practical knowledge	Communication skills	Logical thinking	Job offer	≥ 9	Yes	Excellent	Good	Fast	YES	≥ 9	Yes	Good	Good	Fast	YES	≥ 8	No	Good	Good	Fast	NO	≥ 9	Yes	Good	Good	Slow	YES
CGPA	Interactiveness	Practical knowledge	Communication skills	Logical thinking	Job offer																															
≥ 9	Yes	Excellent	Good	Fast	YES																															
≥ 9	Yes	Good	Good	Fast	YES																															
≥ 8	No	Good	Good	Fast	NO																															
≥ 9	Yes	Good	Good	Slow	YES																															
OR																																				
Q.4	a.	Find Singular Value Decomposition (SVD) of the matrix $A = \begin{pmatrix} 1 & 2 \\ 4 & 9 \end{pmatrix}$.		10	L3	CO2																														

1 of 3





b.	Write Find-S algorithm. Apply the algorithm to obtain the hypothesis for the dataset given in the Table Q.4(b).						10	L3	CO2																																			
	Table Q.4(b)																																											
<table><tr><th>Sky</th><th>Air temp</th><th>Humidity</th><th>Wind</th><th>Water</th><th>Forecast</th><th>Enjoy sport</th></tr><tr><td>Sunny</td><td>Warm</td><td>Normal</td><td>Strong</td><td>Warm</td><td>Same</td><td>YES</td></tr><tr><td>Sunny</td><td>Warm</td><td>High</td><td>Strong</td><td>Warm</td><td>Same</td><td>YES</td></tr><tr><td>Rainy</td><td>Cold</td><td>High</td><td>Strong</td><td>Warm</td><td>Change</td><td>NO</td></tr><tr><td>Sunny</td><td>Warm</td><td>High</td><td>Strong</td><td>Cool</td><td>Change</td><td>YES</td></tr></table>							Sky	Air temp	Humidity	Wind	Water	Forecast	Enjoy sport	Sunny	Warm	Normal	Strong	Warm	Same	YES	Sunny	Warm	High	Strong	Warm	Same	YES	Rainy	Cold	High	Strong	Warm	Change	NO	Sunny	Warm	High	Strong	Cool	Change	YES			
Sky	Air temp	Humidity	Wind	Water	Forecast	Enjoy sport																																						
Sunny	Warm	Normal	Strong	Warm	Same	YES																																						
Sunny	Warm	High	Strong	Warm	Same	YES																																						
Rainy	Cold	High	Strong	Warm	Change	NO																																						
Sunny	Warm	High	Strong	Cool	Change	YES																																						

Module- 3

Module - 3

Q.5	a.	Apply K-nearest neighbor algorithm, for the dataset given in Table Q.5(a). Given a test instance (6.1, 40, 5), use the training set to classify the test instance. Choose K = 3.	6	L3	CO3																												
		Table Q.5(a) <table><tr><th>CGPA</th><th>Assessment</th><th>Project submitted</th><th>Result</th></tr><tr><td>9.2</td><td>85</td><td>8</td><td>PASS</td></tr><tr><td>8</td><td>80</td><td>7</td><td>PASS</td></tr><tr><td>8.5</td><td>81</td><td>8</td><td>PASS</td></tr><tr><td>6</td><td>45</td><td>5</td><td>FAIL</td></tr><tr><td>6.5</td><td>50</td><td>4</td><td>FAIL</td></tr><tr><td>5.8</td><td>38</td><td>5</td><td>FAIL</td></tr></table>	CGPA	Assessment	Project submitted	Result	9.2	85	8	PASS	8	80	7	PASS	8.5	81	8	PASS	6	45	5	FAIL	6.5	50	4	FAIL	5.8	38	5	FAIL			
CGPA	Assessment	Project submitted	Result																														
9.2	85	8	PASS																														
8	80	7	PASS																														
8.5	81	8	PASS																														
6	45	5	FAIL																														
6.5	50	4	FAIL																														
5.8	38	5	FAIL																														
	b.	Explain types of regression methods and limitations of regression methods.	7	L2	CO3																												
	c.	Explain the structure of a decision tree and write the procedure to construct a decision the using ID3 algorithm.	7	L2	CO3																												

OR

Q.6	a.	Write the nearest-centroid classifier algorithm. Apply the same to predict the class for the given test instance (6, 5) using the training dataset given in Table Q.6(a) <table><tr><th>X</th><th>Y</th><th>Class</th></tr><tr><td>3</td><td>1</td><td>A</td></tr><tr><td>5</td><td>2</td><td>A</td></tr><tr><td>4</td><td>3</td><td>A</td></tr><tr><td>7</td><td>6</td><td>B</td></tr><tr><td>6</td><td>7</td><td>B</td></tr><tr><td>8</td><td>5</td><td>B</td></tr></table> Table Q.6(a)	X	Y	Class	3	1	A	5	2	A	4	3	A	7	6	B	6	7	B	8	5	B	7	L3	CO3
X	Y	Class																								
3	1	A																								
5	2	A																								
4	3	A																								
7	6	B																								
6	7	B																								
8	5	B																								
	b.	Distinguish between i) Regression and correlation ii) Regression and causation iii) Linearity and non-linearity relationships.	6	L2	CO3																					
	c.	Explain the advantages and disadvantages of decision tree. Write the general algorithm for decision tree.	7	L2	CO3																					

CBCS SCHEME

USN

--	--	--	--	--	--	--	--	--	--

BAI602

Sixth Semester B.E./B.Tech. Degree Examination, June/July 2025

Machine Learning - I

Time: 3 hrs.

Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. M : Marks , L: Bloom's level , C: Course outcomes

Module – 1			M	L	C																																											
Q.1	a.	Explain the challenges faced in machine learning.	08	L2	CO1																																											
	b.	Explain the types of Data in Big data.	06	L2	CO2																																											
	c.	Describe the four types of data analytics.	06	L2	CO2																																											
OR																																																
Q.2	a.	Briefly explain supervised and unsupervised learning.	08	L2	CO1																																											
	b.	Explain skewness and kurtosis.	06	L2	CO2																																											
	c.	Describe the different types of Data visualization techniques.	06	L2	CO2																																											
Module – 2																																																
Q.3	a.	Explain the types of continuous probability distribution.	06	L2	CO2																																											
	b.	Briefly explain about confusion matrix and ROC curve.	08	L2	CO3																																											
	c.	Let the data points be $\begin{pmatrix} 2 \\ 6 \end{pmatrix}$ and $\begin{pmatrix} 1 \\ 7 \end{pmatrix}$. Apply PCA and find the transformed data.	06	L2	CO2																																											
OR																																																
Q.4	a.	Explain non-parametric density estimation.	06	L2	CO2																																											
	b.	Explain (i) Training (ii) Testing and (iii) Validation (iv) Unbalanced data set.	08	L2	CO3																																											
	c.	Find LU decomposition of the given matrix. $A = \begin{bmatrix} 1 & 2 & 4 \\ 3 & 3 & 2 \\ 3 & 4 & 2 \end{bmatrix}$	06	L3	CO2																																											
Module – 3																																																
Q.5	a.	Explain about linear regression.	06	L2	CO4																																											
	b.	Consider the training dataset given in Table. Use weighted K-NN and determine the class. Given the test instance (7.6, 60, 8) [Assign K = 3]	08	L3	CO4																																											
	<table><tr><th>Sl. No.</th><th>CGPA</th><th>Assessment</th><th>Project submitted</th><th>Result</th></tr><tr><td>1</td><td>9.2</td><td>85</td><td>8</td><td>Pass</td></tr><tr><td>2</td><td>8</td><td>80</td><td>7</td><td>Pass</td></tr><tr><td>3</td><td>8.5</td><td>81</td><td>8</td><td>Pass</td></tr><tr><td>4</td><td>6</td><td>45</td><td>5</td><td>Fail</td></tr><tr><td>5</td><td>6.5</td><td>50</td><td>4</td><td>Fail</td></tr><tr><td>6</td><td>8.2</td><td>72</td><td>7</td><td>Pass</td></tr><tr><td>7</td><td>5.8</td><td>38</td><td>5</td><td>Fail</td></tr><tr><td>8</td><td>8.9</td><td>91</td><td>9</td><td>Pass</td></tr></table>		Sl. No.	CGPA	Assessment	Project submitted	Result	1	9.2	85	8	Pass	2	8	80	7	Pass	3	8.5	81	8	Pass	4	6	45	5	Fail	5	6.5	50	4	Fail	6	8.2	72	7	Pass	7	5.8	38	5	Fail	8	8.9	91	9	Pass	
Sl. No.	CGPA	Assessment	Project submitted	Result																																												
1	9.2	85	8	Pass																																												
2	8	80	7	Pass																																												
3	8.5	81	8	Pass																																												
4	6	45	5	Fail																																												
5	6.5	50	4	Fail																																												
6	8.2	72	7	Pass																																												
7	5.8	38	5	Fail																																												
8	8.9	91	9	Pass																																												
	c.	Explain the differences between Instance based learning and Model – based learning.	06	L2	CO4																																											

1 of 2



OR

Q.6	a.	Explain about logistic regression.	06	L2	CO4										
	b.	Consider the data provided in table and fit it using the second order polynomial. <table><tr><td>X</td><td>Y</td></tr><tr><td>1</td><td>1</td></tr><tr><td>2</td><td>4</td></tr><tr><td>3</td><td>9</td></tr><tr><td>4</td><td>15</td></tr></table>	X	Y	1	1	2	4	3	9	4	15	08	L3	CO4
X	Y														
1	1														
2	4														
3	9														
4	15														
	c.	Explain nearest centroid classifier using an example.	06	L2	CO4										

Module – 4

Q.7	a.	Explain pre-pruning and post – pruning. Compare both the methods.	06	L2	CO4																																																																		
	b.	Assess a student's performance during his course of study and predict whether a student will get a job offer or not in his final year of the course. The training dataset T consists of 10 data instances with attributes such as 'CGPA', 'Interactive', 'Practical knowledge' and 'Communication skills'. The target class attribute is the Job offer. <table border="1"> <tr><th>Sl. No.</th><th>CGPA</th><th>Interactiveness</th><th>Practical knowledge</th><th>Communication skills</th><th>Job Offer</th></tr> <tr><td>1</td><td>≥ 9</td><td>Yes</td><td>Very Good</td><td>Good</td><td>Yes</td></tr> <tr><td>2</td><td>≥ 8</td><td>No</td><td>Good</td><td>Moderate</td><td>Yes</td></tr> <tr><td>3</td><td>≥ 9</td><td>No</td><td>Average</td><td>Poor</td><td>No</td></tr> <tr><td>4</td><td>< 8</td><td>No</td><td>Average</td><td>Good</td><td>No</td></tr> <tr><td>5</td><td>≥ 8</td><td>Yes</td><td>Good</td><td>Moderate</td><td>Yes</td></tr> <tr><td>6</td><td>≥ 9</td><td>Yes</td><td>Good</td><td>Moderate</td><td>Yes</td></tr> <tr><td>7</td><td>< 8</td><td>Yes</td><td>Good</td><td>Poor</td><td>No</td></tr> <tr><td>8</td><td>≥ 9</td><td>No</td><td>Very Good</td><td>Good</td><td>Yes</td></tr> <tr><td>9</td><td>≥ 8</td><td>Yes</td><td>Good</td><td>Good</td><td>Yes</td></tr> <tr><td>10</td><td>≥ 8</td><td>Yes</td><td>Average</td><td>Good</td><td>Yes</td></tr> </table> Table Q.7(b)	Sl. No.	CGPA	Interactiveness	Practical knowledge	Communication skills	Job Offer	1	≥ 9	Yes	Very Good	Good	Yes	2	≥ 8	No	Good	Moderate	Yes	3	≥ 9	No	Average	Poor	No	4	< 8	No	Average	Good	No	5	≥ 8	Yes	Good	Moderate	Yes	6	≥ 9	Yes	Good	Moderate	Yes	7	< 8	Yes	Good	Poor	No	8	≥ 9	No	Very Good	Good	Yes	9	≥ 8	Yes	Good	Good	Yes	10	≥ 8	Yes	Average	Good	Yes	10	L3	CO4
Sl. No.	CGPA	Interactiveness	Practical knowledge	Communication skills	Job Offer																																																																		
1	≥ 9	Yes	Very Good	Good	Yes																																																																		
2	≥ 8	No	Good	Moderate	Yes																																																																		
3	≥ 9	No	Average	Poor	No																																																																		
4	< 8	No	Average	Good	No																																																																		
5	≥ 8	Yes	Good	Moderate	Yes																																																																		
6	≥ 9	Yes	Good	Moderate	Yes																																																																		
7	< 8	Yes	Good	Poor	No																																																																		
8	≥ 9	No	Very Good	Good	Yes																																																																		
9	≥ 8	Yes	Good	Good	Yes																																																																		
10	≥ 8	Yes	Average	Good	Yes																																																																		
	c.	Explain Entropy and Gini Index.	04	L2	CO4																																																																		

OR

Q.8	a.	Using the above Table – Q.7 (b). Assess a student's performance using Naïve Baye's algorithm with the dataset. Predict whether a student gets a job offer or not in his final year of the course.	10	L3	CO4
	b.	Explain maximum A Posterior Hypothesis, h_{MAP} and maximum likelihood (h_{ML}) hypothesis.	06	L2	CO4
	c.	Explain Baye's optimal classifier.	04	L2	CO4

Module – 5

Q.9	a.	Explain the types of artificial neural network.	08	L2	CO4
	b.	Explain Grid-Based approach.	08	L2	CO4
	c.	What are the popular applications of artificial neural networks?	04	L1	CO4
OR					
Q.10	a.	Explain the concept of perceptron and Learning Theory.	08	L2	CO2
	b.	Explain any 4 proximity measures.	08	L2	CO4
	c.	What are the applications of clustering?	04	L1	CO4

CBCS SCHEME

USN

--	--	--	--	--	--	--	--	--	--

BAD613B

Sixth Semester B.E./B.Tech. Degree Examination, June/July 2025 Natural Language Processing

Time: 3 hrs.

Max. Marks: 100

*Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. M : Marks , L: Bloom's level , C: Course outcomes.*

Module – 1			M	L	C
Q.1	a.	Define NLP. List and explain application of NLP.	10	L2	CO1
	b.	Describe Paninian Framework for Indian languages. Explain layered representation of Paninian Grammar and Karkce theory.	10	L3	CO1
OR					
Q.2	a.	Explain transformational grammar with example.	10	L2	CO1
	b.	Consider the following corpus of three sentences. There is a big graden Children play in a graden They play inside beautiful garden Calculate P for the sentence "They play in a big Garden" assuming a Gram Language Model.	10	L3	CO1
Module – 2					
Q.3	a.	Explain minimum edit distance algorithm. Compute minimum edit distance between "Tutor" and "tumor".	10	L3	CO2
	b.	List POS tagging methods. Explain rule based tagger with example.	10	L2	CO2
OR					
Q.4	a.	What is morphological parsing? Explain 2-level morphological model with an example.	10	L2	CO2
	b.	Derive a top-down and bottom-up parse tree for the given sentence. "The angry bear chased the frightened little squirrel" Use the following grammar rule to create the parse tree. $S \rightarrow NP VP$ $NP \rightarrow Det Nom$ $VP \rightarrow V NP$ $Nom \rightarrow Adj N$ $Det \rightarrow the$ $Adj \rightarrow little/angry/frightened$ $N \rightarrow squirrel/bear$ $V \rightarrow Chased.$	10	L3	CO2
Module – 3					
Q.5	a.	Explain the working of the Naïve. Bayes classification algorithm with an example.	10	L2	CO3
	b.	Given the following short movie review, each labeled with a genre, either comedy or action. Fun, couple, love, love comedy Fast couple, shoot action Couple, fly, fast, fun, fun comedy Fly, fast, shoot, fun action Fly, fast, shoot, love action And a new document D' fast, couple, shoot, fly. Compute the most likely for D. Assume a Naïve bayes classifier and use add -1 smoothing for the likelihoods.	10	L3	CO3



BAD613B

OR

Q.6	a.	Explain multi nominal Naive Bayes classifiers briefly.	10	L2	CO3
	b.	Write short notes on : i) Training Naive Bayes classifiers ii) Optimizing for sentiment analysis.	10	L2	CO3

Module – 4

Q.7	a.	Explain design features of IR with a neat diagram.	10	L2	CO4
	b.	Explain the cluster and fuzzy model of IR system.	10	L2	CO4

OR

Q.8	a.	List different IR models. Explain classical information retrieval model.	10	L2	CO4
	b.	Explain WordNet with its applications.	10	L2	CO4

Module – 5

Q.9	a.	What is machine translation? Explain word order typology in detail with an example.	10	L2	CO5
	b.	What is mean by the automatic evaluation? Explain the automatic evaluation of character overlap chrF.	10	L2	CO5

OR

Q.10	a.	Describe the simple encoder-decoder model and identify the attention mechanism of the given sentence "The girl liked the pink frock".	10	L2	CO5
	b.	Write a brief note on bias and word embedding models.	10	L2	CO5

CBCS SCHEME

BCS613D

USN

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Sixth Semester B.E./B.Tech. Degree Examination, June/July 2025

Advanced Java

Max. Marks: 100

Time: 3 hrs.

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. M : Marks, L: Bloom's level, C: Course outcomes.

Module - 1			M	L	C
Q.1	a.	What is a collection framework? Explain the methods defined by collection interface.	10	L2	CO1
	b.	Develop a java program to create an ArrayList of objects of type string. Add any five strings, display size and contents of list. Remove any two strings and display size and contents.	10	L3	CO1
OR					
Q.2	a.	Explain the constructors of tree set class and develop a java program to create TreeSet collection and access it via an iterator.	10	L3	CO1
	b.	Explain any four legacy classes of Java's collection framework.	10	L2	CO1
Module - 2					
Q.3	a.	What is string in Java? Illustrate java program that demonstrates any four constructors of string class.	10	L2	CO2
	b.	Compare between equals() and == with respect to string comparison.	4	L2	CO2
	c.	Explain the following character extraction methods : i) charAt() ii) getChars() iii) toCharArray()	6	L2	CO2
OR					
Q.4	a.	Explain any four string modification methods of string class.	10	L2	CO2
	b.	Explain the following methods of string buffer class: i) append() ii) insert() iii) reverse() iv) replace()	10	L2	CO2
Module - 3					
Q.5	a.	Explain the key features of swing and also develop the program.	10	L3	CO3
	b.	Build a program to demonstrate an icon-based button. Each button displays an icon that represents the flag of a country. When a button is pressed, the name of that country is displayed in the label.	10	L3	CO3
OR					
Q.6	a.	Explain the event handling mechanism used by swing and also develop the program.	10	L3	CO3
	b.	Illustrate the use of radio buttons and also develop the program.	10	L3	CO3



Module – 4

Q.7	a.	List and explain the core classes and interfaces in javax.servlet package.	10	L2	CO4
	b.	Develop a java servlet program to accept two parameters from webpage, find the sum of them and display the result in the webpage. Also give necessary html script to create web page.	10	L3	CO4

OR

Q.8	a.	Define JSP. Explain different JSP tags with suitable example program.	8	L2	CO4
	b.	Explain the life cycle of a servlet.	4	L2	CO4
	c.	What is a cookie? Listout the methods defined by cookie. Develop a Java program to add a cookie.	8	L3	CO4

Module – 5

Q.9	a.	Explain four types of JDBC drivers.	5	L2	CO5
	b.	Construct a code snippet to describe the various steps involved in JDBC process.	10	L3	CO5
	c.	Explain database meta data and result set metadata.	5	L2	CO5

OR

Q.10	a.	What is statement object in JDBC? Explain the following statement objects: i) Callable statement object ii) Prepared statement object.	10	L2	CO5
	b.	Develop a java program to execute a database transaction.	6	L3	CO5
	c.	Show any two syntax of establishing a connection to database.	4	L2	CO5

CBCS SCHEME

USN

--	--	--	--	--	--	--	--	--	--

BIS613D

Sixth Semester B.E./B.Tech. Degree Examination, June/July 2025

Cloud Computing and Security

Time: 3 hrs.

Max. Marks: 100

*Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. M : Marks, L: Bloom's level, C: Course outcomes.*

Module – 1			M	L	C
Q.1	a.	Describe the vision introduced by cloud computing?	06	L2	CO1
	b.	Provide brief characteristics of distributed system with examples?	06	L3	CO1
	c.	What is the major revolution introduced by web 2.0?	08	L2	CO1
OR					
Q.2	a.	Describe the main characteristic of service orientation of cloud computing with examples.	06	L3	CO1
	b.	What is the major distributed computing technology that led to cloud computing.	06	L2	CO1
	c.	Briefly summarize the challenges still open in cloud computing.	08	L1	CO1
Module – 2					
Q.3	a.	What is Xen? Discuss its elements for virtualization.	06	L2	CO2
	b.	Discuss the reference module of full virtualization.	06	L3	CO2
	c.	List and discuss different types of virtualization.	08	L2	CO2
OR					
Q.4	a.	How is cloud development different from traditional software development.	06	L2	CO2
	b.	Discuss the architecture of Hyper – V. Discuss its use in cloud computing.	06	L2	CO2
	c.	Discuss classification on taxonomy of visualization of different levels?	08	L3	CO2
Module – 3					
Q.5	a.	Explain the three primary cloud service models; IaaS PaaS, and SaaS with examples.	06	L2	CO3
	b.	Differentiate between Public, Private and hybrid cloud with advantages and limitation.	06	L3	CO3
	c.	What is a warehouse – scale data center? How does it differ from modular data centers.	08	L2	CO3
OR					
Q.6	a.	Compare the services and target applications of GAE, AWS and Microsoft Azure.	06	L3	CO3
	b.	Describe the fat-free topology and explain its use in data center network architecture.	06	L2	CO3
	c.	Explain the key requirements for an efficient cloud data center interconnection network.	08	L2	CO3



Module – 4

Q.7	a.	What is a trusted Hypervisor? Explain the mobile devices face a range of security challenges?	06	L2	CO4
	b.	Discuss the Security Risks posed by shared images and management os?	06	L2	CO4
	c.	Describe the Hidden Risk in the cloud computing.	08	L3	CO4

OR

Q.8	a.	Explain the best Top 5 Cloud Security Best practices.	06	L2	CO4
	b.	What are the most important advantages of cloud technology for social network.	06	L2	CO4
	c.	Describe the key features of Google?	08	L2	CO4

Module – 5

Q.9	a.	What are the benefits and challenges of using server less computing in the cloud?	06	L2	CO5
	b.	How does grid computing differ from cloud computing.	06	L2	CO5
	c.	What are the key features of cloud computing platforms.	08	L2	CO5

OR

Q.10	a.	How do multi cloud and hybrid cloud strategies differ.	06	L2	CO5
	b.	What is infrastructure as code (IaC) and how if it used in the cloud.	06	L2	CO5
	c.	What are emerging cloud environments.	08	L2	CO5

CBCS SCHEME

USN

--	--	--	--	--	--	--	--	--	--

BME654B

Sixth Semester B.E./B.Tech. Degree Examination, June/July 2025 Renewable Energy Power Plants

Time: 3 hrs.

Max. Marks: 100

*Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. M : Marks, L: Bloom's level, C: Course outcomes.*

Module - 1			M	L	C
Q.1	a.	Explain briefly different renewable and non-renewable energy sources.	10	L2	CO1
	b.	Explain environmental benefits and challenges of renewable energy sources.	10	L2	CO1
OR					
Q.2	a.	Explain extra-terrestrial radiation and special distribution of extra terrestrial radiation.	10	L2	CO1
	b.	Explain solar radiation at the earth's surface.	10	L2	CO1
Module - 2					
Q.3	a.	Explain pyranometer with neat sketch.	10	L2	CO2
	b.	Explain pyr heliometer with neat sketch.	10	L2	CO2
OR					
Q.4	a.	Explain PV system components and their functionalities.	10	L2	CO2
	b.	What are the design considerations for solar power plants.	10	L2	CO2
Module - 3					
Q.5	a.	Explain horizontal wind energy power plant with diagram.	10	L3	CO3
	b.	Explain the parameters effecting the energy extraction through wind.	10	L2	CO1
OR					
Q.6	a.	Explain with schematic diagram the working of a dry steam geothermal power plant.	10	L3	CO3
	b.	What are the problems associated with geothermal conversion.	10	L2	CO3
Module - 4					
Q.7	a.	Explain different ways to extract energy through tides with neat diagram.	10	L3	CO4
	b.	Explain different ways to extract energy through waves with neat diagram.	10	L2	CO4
OR					
Q.8	a.	Describe OTEC and working principle with neat sketch.	10	L2	CO4
	b.	What are the problems associated with OTEC.	10	L2	CO4
Module - 5					
Q.9	a.	Explain fixed dome biogas power plant with diagram.	10	L2	CO5
	b.	Explain gasification with diagram.	10	L2	CO5
OR					
Q.10	a.	Explain Hydrogen Production Technology (Electrolysis method).	10	L2	CO5
	b.	Describe advantages of hydrogen energy.	10	L2	CO5

