

CBCS SCHEME

USN

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

21CS61

Sixth Semester B.E./B.Tech. Degree Examination, June/July 2025 Software Engineering and Project Management

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. What is a software? What are the characteristics of software that is different from hardware? (08 Marks)
- b. Demonstrate the role of each activity in a generic process framework for software engineering. (08 Marks)
- c. Software engineering is a layered technology. Justify with necessary diagram and explanation. (04 Marks)

OR

- 2 a. Explain waterfall model along with its variation with neat diagram. (08 Marks)
- b. Interpret the seven general principles that focus on software engineering. (08 Marks)
- c. Justify that prototyping serves as the better mechanism for identifying software requirements. (04 Marks)

Module-2

- 3 a. Describe the distinct tasks of requirement engineering. (08 Marks)
- b. Sketch an activity diagram for access camera surveillance via the internet–display camera views function. (08 Marks)
- c. Show how the requirements can be validated. (04 Marks)

OR

- 4 a. Discuss the concepts of data modeling with examples. (08 Marks)
- b. Demonstrate the use of CRC modelling in system requirements with an example. (08 Marks)
- c. Distinguish among association, multiplicity and dependencies. (04 Marks)

Module-3

- 5 a. What is Agility? Explain agility principles to be followed to achieve agility. (10 Marks)
- b. Demonstrate extreme programming with diagram and give its values. (10 Marks)

OR

- 6 a. Describe adaptive software development and scrum agile process models. (10 Marks)
- b. Interpret the principles of framework activity “communication”. (10 Marks)

Module-4

- 7 a. What are activities covered by software project management? (06 Marks)
- b. Analyze the software development life cycle with reference to ISO 12207. (10 Marks)
- c. Discuss W5HH principle. (04 Marks)

OR

- 8 a. Discuss the process of setting objectives for project. (06 Marks)
b. Examine the activities involved in software project management and functioning of the project control cycle. (10 Marks)
c. Differentiate between software development and project management life cycles. (04 Marks)

Module-5

- 9 a. Demonstrate the place of software quality in stepwise framework with neat diagram. (10 Marks)
b. Distinguish between Dromey's quality model and Boehm's quality model. (10 Marks)

OR

- 10 a. Give an insight on ISO 9126 with reference to software quality. (10 Marks)
b. Analyze the role of Capability Maturity Model (CMM) to improve quality of software development. (10 Marks)

* * * * *

CBCS SCHEME

USN

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

21CS62

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

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Explain how to configure urls in urls.py. Develop a program to display current data and five, and 4 days ahead. (10 Marks)
- b. What is a web framework? List and explain features of django framework. Explain MVC framework/architecture with a diagram. (10 Marks)

OR

- 2 a. What is loose coupling? Demonstrate the concept of URL confs and loose coupling by taking an example. (10 Marks)
- b. Develop a python CGI script to display ten most recently published books from the database table. (10 Marks)

Module-2

- 3 a. Develop a program to demonstrate the following concepts :
 - i) Selecting objects
 - ii) Filtering data
 - iii) Retrieving single objects
 - iv) Slicing data. (10 Marks)
- b. Develop a program to display
 - i) Unordered list of fruits
 - ii) List of students from a database table. (10 Marks)

OR

- 4 a. Develop a program to demonstrate the concept of :
 - i) Ordering data
 - ii) Reverse ordering data
 - iii) Updating objects
 - iv) Deleting objects. (10 Marks)
- b. What is template inheritance? Develop program to demonstrate template inheritance. (10 Marks)

Module-3

- 5 a. In URL conf, demonstrate with code, the concept of streamlining function imports. (10 Marks)
- b. Develop a program to demonstrate the Concept of Form and Model Form. (10 Marks)

OR

- 6 a. Develop contact form and show how to tie the form to a view. (10 Marks)
- b. List and explain all the steps to be followed up to migration. Write a sample model class. (10 Marks)

Module-4

- 7 a. Develop a program to download the contents of a students table to excel (CSV) file. (10 Marks)
b. Develop program for registering student and displaying a list of students. When a student is selected, display more details about student using django ListView and DetailView. (10 Marks)

OR

- 8 a. Develop a program to download the contents of students table to PDF file. (10 Marks)
b. What is Syndication feed? Develop a program to display latest file blogs using a Simple feed. (10 Marks)

Module-5

- 9 a. What is XMLHttpRequest? List and briefly explain the properties and methods of XMLHttpRequest. (10 Marks)
b. Design and develop a program to demonstrate Ajax calls in jQuery. (10 Marks)

OR

- 10 a. List the technologies on which ajax is overlaid, briefly explain HTML/XHTML, XML, JSON. (10 Marks)
b. Develop a registration page for student enrolment without page refresh using AJAX. (10 Marks)

* * * * *

CBCS SCHEME

USN

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

21CS63

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

Computer Graphics and Fundamentals of Image Processing

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. What is Computer Graphics? Explain the applications of computer graphics. (10 Marks)
- b. Develop the code of the Bresenham's line drawing algorithm for $m < 1.0$. Also digitize a line (20, 10) and (30, 18). (10 Marks)

OR

- 2 a. Explain Raster scan and Random scan display system. (10 Marks)
- b. Explain OpenGL point functions, line functions and line attribute functions with examples. (10 Marks)

Module-2

- 3 a. Explain 2 Dimensional shear and reflection transformations. (08 Marks)
- b. Show that two successive translations and also two successive rotations are additive. (08 Marks)
- c. Rotate a polygon which has a co-ordinate positions (1, 1) (3, 1) and (2, 3) by 90° (Counter clockwise) about a fixed (2, 2). Determine co-ordinates after rotation. Draw original and rotated polygon. (04 Marks)

OR

- 4 a. With the help of suitable diagram show the basic 3D geometric transformation techniques and give the transformation matrix. (10 Marks)
- b. Explain OpenGL Raster transformations and OpenGL geometric transformation functions. (10 Marks)

Module-3

- 5 a. Explain the following :
 - i) Logical input devices
 - ii) Input modes. (10 Marks)
- b. Explain the interactive picture construction techniques with neat diagram. (10 Marks)

OR

- 6 a. Explain development stages for designing of animation sequence. (08 Marks)
- b. Write a note on motion specification. (06 Marks)
- c. Explain OpenGL menu functions. (06 Marks)

Module-4

- 7 a. Define image processing and describe its related fields. (07 Marks)
- b. Explain the 2D geometrical operations used in image processing. (13 Marks)

OR

- 8 a. Explain the types of images based on different criteria. (12 Marks)
b. Explain the arithmetic operation on an image. (08 Marks)

Module-5

- 9 a. Define image segmentation. Explain the classification of the image segmentation algorithms. (10 Marks)
b. Explain the Roberts, Prewitt and Sobel Edge detection operators and write the generic gradient based algorithm. (10 Marks)

OR

- 10 a. Define Edge. Explain the stages in edge detection. (10 Marks)
b. Derive the equation for Laplacian of Gaussian operator and difference of Gaussian filter. (10 Marks)

* * * * *

CBCS SCHEME

USN

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

21CS642

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

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. What is autoboxing? Write a Java program to demonstrate auto boxing/unboxing occurs inside the expression. (06 Marks)
- b. Demonstrate with a Java program values() and valueOf() methods? (08 Marks)
- c. Define annotations. Demonstrate Maker annotation. (06 Marks)

OR

- 2 a. Demonstrate with a Java program, wrapper class. (06 Marks)
- b. Explain with an example how annotation can be send at runtime. (08 Marks)
- c. Explain ordinal values. Compare and contrast with equal enumeration with example. (06 Marks)

Module-2

- 3 a. What is generics? Demonstrate two type parameter generic class. (08 Marks)
- b. Write a Java program to demonstrate bounded types. (06 Marks)
- c. Explain Generic Class Hierarchies with example. (06 Marks)

OR

- 4 a. Explain Generic Interfaces with an example. (06 Marks)
- b. Write a Java program to demonstrate wild card arguments in Java generics. (07 Marks)
- c. Explain Bridge methods in Java generics. (07 Marks)

Module-3

- 5 a. Define String. Write a Java program to demonstrate constructor of string class. (05 Marks)
- b. Explain string handling methods to modify a string. (10 Marks)
- c. Develop a Java program to count the occurrence of character in given string. (05 Marks)

OR

- 6 a. Explain the following character extraction methods:
(i) CharAt() (ii) toCharArray() (06 Marks)
- b. Explain any 5 string buffer methods with an example. (10 Marks)
- c. Explain any two string comparison method. (04 Marks)

Module-4

- 7 a. Explain the life cycle of a servlet with a neat diagram. (04 Marks)
- b. Write a Java program to display sum of two numbers on browser. (10 Marks)
- c. Write a Java program to create a cookie. (06 Marks)

OR

- 8 a. What is JSP? Explain the various types of JSP tags with examples. (10 Marks)
- b. Explain the concept of reading servlet parameter with an example. (10 Marks)

Module-5

- 9 a. Explain 4 types of JDBC drivers. (08 Marks)
- b. Describe the following concepts :
i) Scrollable result set
ii) Callable statement
iii) Transaction processing
iv) Updateable result set (12 Marks)

OR

- 10 a. Describe the various steps involved in JDBC process with a code snippet. (10 Marks)
- b. List and explain the three kinds of exceptions occurred in JDBC with an example. (10 Marks)

* * * * *

USN

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

21CS644

Sixth Semester B.E./B.Tech. Degree Examination, June/July 2025 Data Science and Visualization

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. What is data science? Explain relationship between data science and big data. (10 Marks)
- b. Define model. Explain the how you can build a statistical model. (10 Marks)

OR

- 2 a. Explain the Venn diagram of data science. (10 Marks)
- b. Explain the probability distribution. (05 Marks)
- c. Differentiate population and sample, explain the notion of population and sample in the context of Big Data. (05 Marks)

Module-2

- 3 a. Explain data science process with neat diagram. (10 Marks)
- b. Consider the following dataset given in table cluster, it using K-means algorithm with the initial value of objects 2 and 5 with the co-ordinate values (4, 6) and (12, 4) as initial seeds.

Objects	x-co-ordinate	y-co-ordinate
1	2	4
2	4	6
3	6	8
4	10	4
5	12	4

- (05 Marks)
- c. Explain the linear regression algorithm with R implementation with example. (05 Marks)

OR

- 4 a. Explain EDA with suitable example. (10 Marks)
- b. Explain the K-NN algorithm in detail with example. (10 Marks)

Module-3

- 5 a. Assume a student performance during his course of study and predict whether the student will get a Job-offer or not in his final year of the course.

Sl. No.	CGPA	Interactiveness	Practical knowledge	Communication skills	Job-offer
1	≥ 9	Yes	V. good	Good	Yes
2	≥ 8	No	Good	Medium	Yes
3	≥ 9	No	Average	Poor	No
4	< 8	No	Average	Good	No
5	≥ 8	Yes	Good	Medium	Yes
6	≥ 9	Yes	Good	Medium	Yes
7	< 8	Yes	Good	Poor	No
8	≥ 9	No	V. Good	Poor	Yes
9	≥ 8	Yes	Good	Good	Yes
10	≥ 8	Yes	Average	Good	Yes

Draw decision tree using CART algorithm with Gini index technique.

(10 Marks)

- b. Explain random forest algorithm with example and advantages and disadvantages.

(10 Marks)

OR

- 6 a. Explain singular value decomposition. (10 Marks)
 b. Define feature extracting, how to do extracting of features and explain its applications. (05 Marks)
 c. Briefly explain the attribute selection measure technique with example. (05 Marks)

Module-4

- 7 a. Define data visualization, Explain the importance of it. (10 Marks)
 b. Define Data Wrangling. Explain with suitable example. (10 Marks)

OR

- 8 a. Explain the any three relation plots with implementation of example dataset. (10 Marks)
 b. Explain any two composition plot and distribution plot with neat diagram. (10 Marks)

Module-5

- 9 a. How to plot a graph using R – implementation. Explain with proper example. (10 Marks)
 b. Define scatter plots. Explain types of scatter plots in detail. (05 Marks)
 c. What is Histogram? How we use Histograms in data science? (05 Marks)

OR

- 10 a. Write image operations and explain with example. (05 Marks)
 b. Explain the following:
 i) Labels
 ii) Titles
 iii) Annotations
 iv) Legends (05 Marks)
 c. How to create, display and closing figures and format strings? Explain with proper implementation. (10 Marks)

* * * * *

USN

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

21CS653

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

Introduction to Cyber Security

Time: 3 hrs.

Max. Marks: 100

Note : Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Define Cybercrime. Categorize the cyber criminals. (08 Marks)
- b. Write a note on following : (12 Marks)
 - i) Cyberdefamation
 - ii) Computer sabotage
 - iii) Credit card frauds
 - iv) Salami attack
 - v) Spamming
 - vi) Identity theft.

OR

- 2 a. Briefly explain Legal perspective and Indian perspective of cybercrime. (06 Marks)
- b. Write a note on Indian ITA 2000. (04 Marks)
- c. Classify the Cybercrimes with examples for each. (10 Marks)

Module-2

- 3 a. Explain the phases involved in planning cybercrime. (10 Marks)
- b. With a case study, explain cyber stalking. (05 Marks)
- c. Classify and explain any five human - based social engineering. (05 Marks)

OR

- 4 a. What are the safety and security measures to be considered while using a computer in a cyber café? (08 Marks)
- b. Define botnet. How one can secure the system from botnet attack. (08 Marks)
- c. Write a note on attack vector. (04 Marks)

Module-3

- 5 a. What are the differences between proxy server and anonymizer? (05 Marks)
- b. What is phishing? Explain how phishing works. (07 Marks)
- c. Define virus. Explain different types of viruses. (08 Marks)

OR

- 6 a. What are DoS and DDoS attacks? Explain the types of DoS attack. (10 Marks)
- b. Explain traditional techniques of attacks on wireless networks. (10 Marks)

Module-4

- 7 a. Define criminal profiling. Explain different profiling methods. (06 Marks)
- b. Discuss any five common misconceptions regarding cybercriminals. (10 Marks)
- c. List the common motives for committing cybercrime. (04 Marks)

OR

- 8 a. Explain the ten characteristics of good cyber investigator. (10 Marks)
- b. What is Encryption? List different encryption algorithms. (05 Marks)
- c. Write a note on Steganography. (05 Marks)

Module-5

- 9 a. Discuss how Firewall logs , Reports , Alarms and Alerts can be used to detect cybercrime attack. (08 Marks)
- b. With the key commands, describe how Domain Name or IP address is traced? (06 Marks)
- c. Define Evidence. Brief on its categories. (06 Marks)

OR

- 10 a. Explain collection and preserving of digital evidence. (06 Marks)
- b. Briefly explain evidence tagging and marking. Also brief on evidence logs. (06 Marks)
- c. What are the different types of data that should be examined for evidence in case of cyber crime? (08 Marks)

* * * * *

CBCS SCHEME

USN

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

21CS654

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

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. What are the three fundamental principles of Object Oriented Programming (OOP)? (10 Marks)
- b. Illustrate the difference between type conversion and type casting with examples. (10 Marks)

OR

- 2 a. What is meant by scope of a variable? Explain the importance of scope operator with example. (10 Marks)
- b. Write a java code to read two numbers and display their sum, product and difference. (10 Marks)

Module-2

- 3 a. Explain two looping statements available in Java with examples. (10 Marks)
- b. Explain where ladder if-else statements would be more appropriate than switch statement with an example. (10 Marks)

OR

- 4 a. Demonstrate with an example the use of 'continue' and 'break' statements in while loop. (10 Marks)
- b. Explain the use of switch statement with an example. Also emphasise on the significance of 'default' case in switch statement. (10 Marks)

Module-3

- 5 a. Explain the concept of reference passing when using objects as parameters, with an example. (10 Marks)
- b. What is the use of static keyword in Java explain with an example. (10 Marks)

OR

- 6 a. What is method over loading? Explain with example. (10 Marks)
- b. What is a stack? Implement a stack in Java with push, pop and peep methods. (10 Marks)

Module-4

- 7 a. How do you create a user defined package in Java? Explain with an example. (10 Marks)
- b. What is the purpose of 'try' block in exception handling? Also explain the role of finally block in exception handling. (10 Marks)

OR

- 8 a. What is an Interface? How do you define an interface in Java? Explain with example. (10 Marks)
- b. What is exception hierarchy in Java? Explain with an example. (10 Marks)

Module-5

- 9 a. Explain the following :
(i) Enumeration
(ii) Type wrappers (10 Marks)
- b. What is string literal and how is it treated in Java? Why does Java automatically create string objects from string literals? (10 Marks)

OR

- 10 a. What is the difference between string buffer and string builder? Explain with an example. (10 Marks)
- b. List and explain any four string method which can be used to modify a given string. (10 Marks)

* * * * *

CBCS SCHEME

USN

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

BCS601

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

Cloud Computing

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 critical cluster design issues and feasible implementation.	8	L2	CO2
	b.	Describe VM primitive operations.	6	L2	CO2
	c.	Explain virtual machine with architectures of compared with traditional physical machine.	6	L2	CO1
OR					
Q.2	a.	Explain the following: i) Internet of thing ii) Cyber physical systems iii) Memory storage and wide area networking	2 2 6	L1	CO1
	b.	Explain computing paradigm distinctions.	5	L2	CO2
	c.	Describe the classification of parallel and distributed computing systems.	5	L2	CO2
Module – 2					
Q.3	a.	Explain implementation levels of virtualization.	5	L2	CO2
	b.	Draw architecture of computer before and after virtualization.	5	L3	CO2
	c.	Explain how virtualization support at OS level.	10	L3	CO2
OR					
Q.4	a.	Explain virtualization of CPU/memory and I/O devices.	10	L2	CO3
	b.	Describe virtualization for data center automation.	10	L2	CO2
Module – 3					
Q.5	a.	Explain cloud service models with the diagram.	5	L2	CO2
	b.	Explain cloud deployment models.	5	L2	CO2
	c.	Write a note on public cloud platforms, GAE, AWS and Azure.	10	L2	CO3

BCS601					
OR					
Q.6	a.	Define cloud computing and list the characteristics.	5	L1	CO1
	b.	Write benefits and challenges of each service.	5	L1	CO1
	c.	Write a note on Inter cloud resource management.	10	L3	CO3
Module – 4					
Q.7	a.	Summarize cloud data encryption and challenges in data encryption.	8	L2	CO1
	b.	Write a note on cloud security define strategies.	6	L2	CO1
	c.	Explain anomaly detection techniques in cloud.	6	L3	CO3
OR					
Q.8	a.	Describe data and software protection techniques.	8	L2	CO2
	b.	Briefly explain reputation-guided protection of data centers.	6	L2	CO1
	c.	Explain access control and identity access management.	6	L1	CO2
Module – 5					
Q.9	a.	Write difference between cloud and grid computing.	6	L1	CO2
	b.	Explain the following : i) Server keys computing ii) Edge computing iii) AI/ML in cloud iv) Containerization with Docker and Kubernetes v) Quantum computing in cloud	10	L2	CO2
	c.	Explain AWS services.	4	L2	CO2
OR					
Q.10	a.	Explain the features of cloud and grid computing.	10	L1	CO2
	b.	Distinguish between AWS, Azure, GCP, IBM cloud.	6	L3	CO3
	c.	List out best practices for cloud software development.	4	L3	CO3

* * * * *

CBCS SCHEME

USN

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

BCS602

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).

Table Q.4(b)

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

- 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.

Table Q.5(a)

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.

- c.** Explain the structure of a decision tree and write the procedure to construct a decision the using ID3 algorithm.

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).

X	Y	Class
3	1	A
5	2	A
4	3	A
7	6	B
6	7	B
8	5	B

Table Q.6(a)

- b.** Distinguish between
 i) Regression and correlation
 ii) Regression and causation
 iii) Linearity and non-linearity relationships.

- c.** Explain the advantages and disadvantages of decision tree. Write the general algorithm for decision tree.

Module – 4

Q.7	a.	Using Naïve bayes classifier classify the new data (Red, SUV, Domestic) using the training dataset given in Table Q.7(a). Table Q.7(a) <table><tr><td>Color</td><td>Type</td><td>Origin</td><td>Stolen</td></tr><tr><td>Red</td><td>Sports</td><td>Domestic</td><td>YES</td></tr><tr><td>Red</td><td>Sports</td><td>Domestic</td><td>NO</td></tr><tr><td>Red</td><td>Sports</td><td>Domestic</td><td>YES</td></tr><tr><td>Yellow</td><td>Sports</td><td>Domestic</td><td>NO</td></tr><tr><td>Yellow</td><td>Sports</td><td>Imported</td><td>YES</td></tr><tr><td>Yellow</td><td>SUV</td><td>Imported</td><td>NO</td></tr><tr><td>Yellow</td><td>SUV</td><td>Imported</td><td>YES</td></tr><tr><td>Yellow</td><td>SUV</td><td>Domestic</td><td>NO</td></tr><tr><td>Red</td><td>SUV</td><td>Imported</td><td>NO</td></tr><tr><td>Red</td><td>Sports</td><td>Imported</td><td>YES</td></tr></table>	Color	Type	Origin	Stolen	Red	Sports	Domestic	YES	Red	Sports	Domestic	NO	Red	Sports	Domestic	YES	Yellow	Sports	Domestic	NO	Yellow	Sports	Imported	YES	Yellow	SUV	Imported	NO	Yellow	SUV	Imported	YES	Yellow	SUV	Domestic	NO	Red	SUV	Imported	NO	Red	Sports	Imported	YES	10	L3	CO4
Color	Type	Origin	Stolen																																														
Red	Sports	Domestic	YES																																														
Red	Sports	Domestic	NO																																														
Red	Sports	Domestic	YES																																														
Yellow	Sports	Domestic	NO																																														
Yellow	Sports	Imported	YES																																														
Yellow	SUV	Imported	NO																																														
Yellow	SUV	Imported	YES																																														
Yellow	SUV	Domestic	NO																																														
Red	SUV	Imported	NO																																														
Red	Sports	Imported	YES																																														
	b.	Explain the simple model of an artificial neuron along with the artificial neural network structure.	10	L2	CO4																																												

OR

Q.8	a.	Explain Bayes theorem, Maximum A Posteriori (MAP) hypothesis and Maximum Likelihood (ML) hypothesis in detail.	10	L2	CO4
	b.	Explain different activation functions used in artificial neural network.	10	L2	CO4

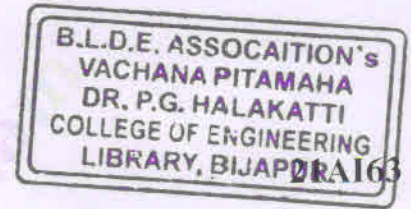
Module – 5

Q.9	a.	Consider the following set of data given in Table Q.9(a). Cluster it using K-means algorithm with initial value of objects 2 and 5 with the coordinate values (4, 6) and (12, 4) as initial seeds. Table Q.9(a) <table><tr><th>Objects</th><th>X-coordinate</th><th>Y-coordinate</th></tr><tr><td>1</td><td>2</td><td>4</td></tr><tr><td>2</td><td>4</td><td>6</td></tr><tr><td>3</td><td>6</td><td>8</td></tr><tr><td>4</td><td>10</td><td>4</td></tr><tr><td>5</td><td>12</td><td>4</td></tr></table>	Objects	X-coordinate	Y-coordinate	1	2	4	2	4	6	3	6	8	4	10	4	5	12	4	10	L3	CO5
Objects	X-coordinate	Y-coordinate																					
1	2	4																					
2	4	6																					
3	6	8																					
4	10	4																					
5	12	4																					
	b.	Explain the various components of reinforcement learning.	10	L2	CO5																		

OR

Q.10	a.	Find the Manhattan and Chebyshev distance if the coordinates of the objects are (0, 3) and (5, 8).	4	L3	CO5
	b.	Explain the mean shift clustering algorithm.	6	L2	CO5
	c.	List and explain the i) Characteristics of reinforcement learning ii) Challenges of reinforcement learning iii) Applications of reinforcement learning	10	L3	CO5

CBCS SCHEME



USN

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

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

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. List and explain the step's to design a learning system in detail. (08 Marks)
- b. List the different challenges of Machine Learning. (04 Marks)
- c. Explain version space and consider the Enjoyspot concept and Instance give below. Identify the specific hypo thesis using "Find - s" Algorithm.

Example	Sky	Air temp	Humidity	Wind	Water	Forecast	Enjoyspots
1	Sunny	Warm	Normal	Strong	Warm	Same	Yes
2	Sunny	Cold	High	Strong	Warm	Change	No
3	Rainy	Cold	High	Strong	Cool	Same	Yes
4	Sunny	Warm	High	Strong	Warm	Change	Yes

(08 Marks)

OR

- 2 a. Define machine learning and Explain main types of Machine learning. (10 Marks)
- b. Consider the "Japanese Economy car" concept and Instance given below, Identify the hypotheses using candidate - Elimination Learning algorithm. (10 Marks)

ORIGIN	MANUFACTURER	COLOR	YEAR	TYPE	CLASS
Japan	Honda	Blue	1980	Economy	Yes
Japan	Toyota	Green	1970	Sports	No
Japan	Toyota	Blue	1990	Economy	Yes
Germany	Wolk's Wagn	Red	1980	Sports	No
Japan	Honda	White	1980	Economy	Yes
Japan	Toyota	Green	1980	Economy	Yes
Japan	Honda	Red	1980	Economy	Yes

Module-2

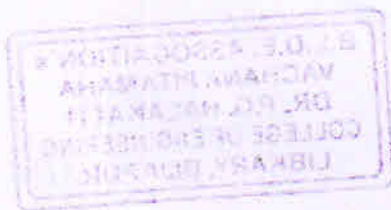
- 3 a. Explain the different steps to get data in data-preprocessing, with code. (10 Marks)
- b. Using code snippet, Explain the concepts involved in
 - i) Data cleaning
 - ii) Select and train the model
 - iii) Discover and Visualize the data

(10 Marks)

OR

- 4 a. Explain. i) MNIST ii) Performance measure iii) Multi Label classification. (10 Marks)
- b. Using code snippet, outline the concepts involved in,
 - i) Measuring accuracy using cross validation.
 - ii) Confusion Matrix
 - iii) Precision, F_1 - score and recall

(10 Marks)



21AI63

Module-3

- 5 a. Explain Linear Regression with code snippet. (10 Marks)
b. Explain the three different Regularized Linear Models. (10 Marks)

OR

- 6 a. Explain Logistic Regression with code snippet. (10 Marks)
b. Explain support vector Machine regression. (10 Marks)

Module-4

- 7 a. Explain the concept of :
i) Bagging and Pasting
ii) Random Forests. (10 Marks)
b. Define Boosting. Explain the different variant's of Boosting. (10 Marks)

OR

- 8 a. Explain CART Training Algorithm and regularization Hyper parameters. (10Marks)
b. Write a short not on "
i) Entropy
ii) Voting classifier
iii) GINI impurity (10 Marks)

Module-5

- 9 a. Explain Naïve Bayes classifier and Apply the dataset given below.

No.	Color	Legs	Height	Smelly	Species
1	White	3	Short	Yes	M
2	Green	2	Tall	No	M
3	Green	3	Short	Yes	M
4	White	3	Short	Yes	M
5	Green	2	Short	No	H
6	White	2	Tall	No	H
7	White	2	Tall	No	H
8	White	2	Short	Yes	H

- b. Derive the EM Algorithm in detail. (12 Marks)
(08 Marks)

OR

- 10 a. Explain Bayesian Belief Network with Example. (10 Marks)
b. Explain Gibbs Algorithm. (10 Marks)

USN

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

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

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. List out the components and explain business pressures and responses support model. (10 Marks)
- b. Describe three major managerial roles and list some of the specific activities in each. (10 Marks)

OR

- 2 a. Define data analytics. Explain different types of analytics. (10 Marks)
- b. Define Business Intelligence. Explain the architecture of BI model with neat diagram. (10 Marks)

Module-2

- 3 a. List out and explain different phases of decision making process. (10 Marks)
- b. Explain various types of activities involved in intelligence phase. (10 Marks)

OR

- 4 a. Briefly explain how can sensitivity analysis helps in choice phase. (10 Marks)
- b. Define goal seeking in business intelligence. Explain tools and technologies of goal seeking in BI. (10 Marks)

Module-3

- 5 a. How does a data warehouse differ from a database? Differentiate among data mart, ODS and an EDW. (10 Marks)
- b. Describe data ware housing process and its major components. (10 Marks)

OR

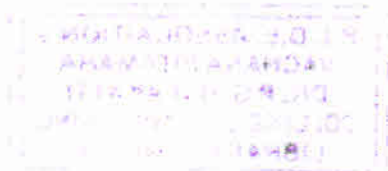
- 6 a. Explain key similarities and differences between a two-tiered architecture and a three-tiered architecture. (10 Marks)
- b. Describe three steps of ETL process. Explain why ETL process is important for data warehousing efforts. (10 Marks)

Module-4

- 7 a. Define knowledge management system. Explain the relationship between data information and knowledge with neat diagram. (10 Marks)
- b. Write a note on different types of approaches in knowledge management. (10 Marks)

OR

- 8 a. Define KMS and describe the components of KMS cycle. (10 Marks)
- b. Write a note on key technologies that support knowledge management. (10 Marks)



Module-5

- 9 a. Briefly explain the applications of expert systems.
b. List out and explain major features of expert systems.

(10 Marks)

(10 Marks)

OR

- 10 a. Explain the process of knowledge engineering.
b. List out and explain problem are as suitable for expert systems.

(10 Marks)

(10 Marks)

* * * * *

USN

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

Sixth Semester B.E./B.Tech. Degree Examination, June/July 2025
Software Engineering and Project Management

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. What is a software? What are the characteristics of software that is different from hardware? (08 Marks)
- b. Demonstrate the role of each activity in a generic process framework for software engineering. (08 Marks)
- c. Software engineering is a layered technology. Justify with necessary diagram and explanation. (04 Marks)

OR

- 2 a. Explain waterfall model along with its variation with neat diagram. (08 Marks)
- b. Interpret the seven general principles that focus on software engineering. (08 Marks)
- c. Justify that prototyping serves as the better mechanism for identifying software requirements. (04 Marks)

Module-2

- 3 a. Describe the distinct tasks of requirement engineering. (08 Marks)
- b. Sketch an activity diagram for access camera surveillance via the internet-display camera views function. (08 Marks)
- c. Show how the requirements can be validated. (04 Marks)

OR

- 4 a. Discuss the concepts of data modeling with examples. (08 Marks)
- b. Demonstrate the use of CRC modelling in system requirements with an example. (08 Marks)
- c. Distinguish among association, multiplicity and dependencies. (04 Marks)

Module-3

- 5 a. What is Agility? Explain agility principles to be followed to achieve agility. (10 Marks)
- b. Demonstrate extreme programming with diagram and give its values. (10 Marks)

OR

- 6 a. Describe adaptive software development and scrum agile process models. (10 Marks)
- b. Interpret the principles of framework activity "communication". (10 Marks)

Module-4

- 7 a. What are activities covered by software project management? (06 Marks)
- b. Analyze the software development life cycle with reference to ISO 12207. (10 Marks)
- c. Discuss W5HH principle. (04 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
 2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

OR

- 8 a. Discuss the process of setting objectives for project. (06 Marks)
b. Examine the activities involved in software project management and functioning of the project control cycle. (10 Marks)
c. Differentiate between software development and project management life cycles. (04 Marks)

Module-5

- 9 a. Demonstrate the place of software quality in stepwise framework with neat diagram. (10 Marks)
b. Distinguish between Dromey's quality model and Boehm's quality model. (10 Marks)

OR

- 10 a. Give an insight on ISO 9126 with reference to software quality. (10 Marks)
b. Analyze the role of Capability Maturity Model (CMM) to improve quality of software development. (10 Marks)

USN

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

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

Full Stack Development

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Explain how to configure urls in urls.py. Develop a program to display current data and five, and 4 days ahead. (10 Marks)
- b. What is a web framework? List and explain features of django framework. Explain MVC framework/architecture with a diagram. (10 Marks)

OR

- 2 a. What is loose coupling? Demonstrate the concept of URL confs and loose coupling by taking an example. (10 Marks)
- b. Develop a python CGI script to display ten most recently published books from the database table. (10 Marks)

Module-2

- 3 a. Develop a program to demonstrate the following concepts :
 - i) Selecting objects
 - ii) Filtering data
 - iii) Retrieving single objects
 - iv) Slicing data. (10 Marks)
- b. Develop a program to display
 - i) Unordered list of fruits
 - ii) List of students from a database table. (10 Marks)

OR

- 4 a. Develop a program to demonstrate the concept of:
 - i) Ordering data
 - ii) Reverse ordering data
 - iii) Updating objects
 - iv) Deleting objects. (10 Marks)
- b. What is template inheritance? Develop program to demonstrate template inheritance. (10 Marks)

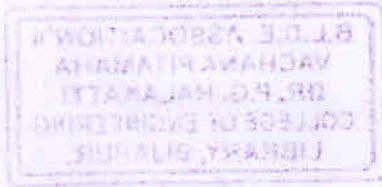
Module-3

- 5 a. In URL conf, demonstrate with code, the concept of streamlining function imports. (10 Marks)
- b. Develop a program to demonstrate the Concept of Form and Model Form. (10 Marks)

OR

- 6 a. Develop contact form and show how to tie the form to a view. (10 Marks)
- b. List and explain all the steps to be followed up to migration. Write a sample model class. (10 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8=50, will be treated as malpractice.



21CS62

Module-4

- 7 a. Develop a program to download the contents of a students table to excel (CSV) file. (10 Marks)
b. Develop program for registering student and displaying a list of students. When a student is selected, display more details about student using django ListView and DetailView. (10 Marks)

OR

- 8 a. Develop a program to download the contents of students table to PDF file. (10 Marks)
b. What is Syndication feed? Develop a program to display latest file blogs using a Simple feed. (10 Marks)

Module-5

- 9 a. What is XMLHttpRequest? List and briefly explain the properties and methods of XMLHttpRequest. (10 Marks)
b. Design and develop a program to demonstrate Ajax calls in jQuery. (10 Marks)

OR

- 10 a. List the technologies on which ajax is overlaid, briefly explain HTML/XHTML, XML, JSON. (10 Marks)
b. Develop a registration page for student enrolment without page refresh using AJAX. (10 Marks)

USN

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

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

Computer Graphics and Fundamentals of Image Processing

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. What is Computer Graphics? Explain the applications of computer graphics. (10 Marks)
- b. Develop the code of the Bresenham's line drawing algorithm for $m < 1.0$. Also digitize a line (20, 10) and (30, 18). (10 Marks)

OR

- 2 a. Explain Raster scan and Random scan display system. (10 Marks)
- b. Explain OpenGL point functions, line functions and line attribute functions with examples. (10 Marks)

Module-2

- 3 a. Explain 2 Dimensional shear and reflection transformations. (08 Marks)
- b. Show that two successive translations and also two successive rotations are additive. (08 Marks)
- c. Rotate a polygon which has a co-ordinate positions (1, 1) (3, 1) and (2, 3) by 90° (Counter clockwise) about a fixed (2, 2). Determine co-ordinates after rotation. Draw original and rotated polygon. (04 Marks)

OR

- 4 a. With the help of suitable diagram show the basic 3D geometric transformation techniques and give the transformation matrix. (10 Marks)
- b. Explain OpenGL Raster transformations and OpenGL geometric transformation functions. (10 Marks)

Module-3

- 5 a. Explain the following :
 i) Logical input devices
 ii) Input modes. (10 Marks)
- b. Explain the interactive picture construction techniques with neat diagram. (10 Marks)

OR

- 6 a. Explain development stages for designing of animation sequence. (08 Marks)
- b. Write a note on motion specification. (06 Marks)
- c. Explain OpenGL menu functions. (06 Marks)

Module-4

- 7 a. Define image processing and describe its related fields. (07 Marks)
- b. Explain the 2D geometrical operations used in image processing. (13 Marks)

OR

- 8 a. Explain the types of images based on different criteria. (12 Marks)
b. Explain the arithmetic operation on an image. (08 Marks)

Module-5

- 9 a. Define image segmentation. Explain the classification of the image segmentation algorithms. (10 Marks)
b. Explain the Roberts, Prewitt and Sobel Edge detection operators and write the generic gradient based algorithm. (10 Marks)

OR

- 10 a. Define Edge. Explain the stages in edge detection. (10 Marks)
b. Derive the equation for Laplacian of Gaussian operator and difference of Gaussian filter. (10 Marks)

* * * * *

USN

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

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

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. What is autoboxing? Write a Java program to demonstrate auto boxing/unboxing occurs inside the expression. (06 Marks)
- b. Demonstrate with a Java program values() and valueOf() methods? (08 Marks)
- c. Define annotations. Demonstrate Maker annotation. (06 Marks)

OR

- 2 a. Demonstrate with a Java program, wrapper class. (06 Marks)
- b. Explain with an example how annotation can be send at runtime. (08 Marks)
- c. Explain ordinal values. Compare and contrast with equal enumeration with example. (06 Marks)

Module-2

- 3 a. What is generics? Demonstrate two type parameter generic class. (08 Marks)
- b. Write a Java program to demonstrate bounded types. (06 Marks)
- c. Explain Generic Class Hierarchies with example. (06 Marks)

OR

- 4 a. Explain Generic Interfaces with an example. (06 Marks)
- b. Write a Java program to demonstrate wild card arguments in Java generics. (07 Marks)
- c. Explain Bridge methods in Java generics. (07 Marks)

Module-3

- 5 a. Define String. Write a Java program to demonstrate constructor of string class. (05 Marks)
- b. Explain string handling methods to modify a string. (10 Marks)
- c. Develop a Java program to count the occurrence of character in given string. (05 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
 2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8=50, will be treated as malpractice.

OR

- 6 a. Explain the following character extraction methods:
(i) CharAt() (ii) toCharArray() (06 Marks)
- b. Explain any 5 string buffer methods with an example. (10 Marks)
- c. Explain any two string comparison method. (04 Marks)

Module-4

- 7 a. Explain the life cycle of a servlet with a neat diagram. (04 Marks)
- b. Write a Java program to display sum of two numbers on browser. (10 Marks)
- c. Write a Java program to create a cookie. (06 Marks)

OR

- 8 a. What is JSP? Explain the various types of JSP tags with examples. (10 Marks)
- b. Explain the concept of reading servlet parameter with an example. (10 Marks)

Module-5

- 9 a. Explain 4 types of JDBC drivers. (08 Marks)
- b. Describe the following concepts :
i) Scrollable result set
ii) Callable statement
iii) Transaction processing
iv) Updateable result set (12 Marks)

OR

- 10 a. Describe the various steps involved in JDBC process with a code snippet. (10 Marks)
- b. List and explain the three kinds of exceptions occurred in JDBC with an example. (10 Marks)

USN

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

Sixth Semester B.E./B.Tech. Degree Examination, June/July 2025
Data Science and Visualization

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. What is data science? Explain relationship between data science and big data. (10 Marks)
- b. Define model. Explain the how you can build a statistical model. (10 Marks)

OR

- 2 a. Explain the Venn diagram of data science. (10 Marks)
- b. Explain the probability distribution. (05 Marks)
- c. Differentiate population and sample, explain the notion of population and sample in the context of Big Data. (05 Marks)

Module-2

- 3 a. Explain data science process with neat diagram. (10 Marks)
- b. Consider the following dataset given in table cluster, it using K-means algorithm with the initial value of objects 2 and 5 with the co-ordinate values (4, 6) and (12, 4) as initial seeds.

Objects	x-co-ordinate	y-co-ordinate
1	2	4
2	4	6
3	6	8
4	10	4
5	12	4

(05 Marks)

- c. Explain the linear regression algorithm with R implementation with example. (05 Marks)

OR

- 4 a. Explain EDA with suitable example. (10 Marks)
- b. Explain the K-NN algorithm in detail with example. (10 Marks)

Module-3

- 5 a. Assume a student performance during his course of study and predict whether the student will get a Job-offer or not in his final year of the course.

Sl. No.	CGPA	Interactiveness	Practical knowledge	Communication skills	Job-offer
1	≥ 9	Yes	V. good	Good	Yes
2	≥ 8	No	Good	Medium	Yes
3	≥ 9	No	Average	Poor	No
4	< 8	No	Average	Good	No
5	≥ 8	Yes	Good	Medium	Yes
6	≥ 9	Yes	Good	Medium	Yes
7	< 8	Yes	Good	Poor	No
8	≥ 9	No	V. Good	Poor	Yes
9	≥ 8	Yes	Good	Good	Yes
10	≥ 8	Yes	Average	Good	Yes

Draw decision tree using CART algorithm with Gini index technique.

(10 Marks)

- b. Explain random forest algorithm with example and advantages and disadvantages.

(10 Marks)

OR

- 6 a. Explain singular value decomposition. (10 Marks)
 b. Define feature extracting, how to do extracting of features and explain its applications. (05 Marks)
 c. Briefly explain the attribute selection measure technique with example. (05 Marks)

Module-4

- 7 a. Define data visualization, Explain the importance of it. (10 Marks)
 b. Define Data Wrangling. Explain with suitable example. (10 Marks)

OR

- 8 a. Explain the any three relation plots with implementation of example dataset. (10 Marks)
 b. Explain any two composition plot and distribution plot with neat diagram. (10 Marks)

Module-5

- 9 a. How to plot a graph using R – implementation. Explain with proper example. (10 Marks)
 b. Define scatter plots. Explain types of scatter plots in detail. (05 Marks)
 c. What is Histogram? How we use Histograms in data science? (05 Marks)

OR

- 10 a. Write image operations and explain with example. (05 Marks)
 b. Explain the following:
 i) Labels
 ii) Titles
 iii) Annotations
 iv) Legends (05 Marks)
 c. How to create, display and closing figures and format strings? Explain with proper implementation. (10 Marks)

USN

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

21CS65

Sixth Semester B.E./B.Tech. Degree Examination, June/July 2025 Introduction to Cyber Security

Time: 3 hrs.

Max. Marks: 100

Note : Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Define Cybercrime. Categorize the cyber criminals. (08 Marks)
b. Write a note on following :

i) Cyberdefamation ii) Computer sabotage iii) Credit card frauds

- b. Write a note on Indian IT Act, 2008.
c. Classify the Cybercrimes with examples for each.

Module-2

- 3 a. Explain the phases involved in planning cybercrime.
b. With a case study, explain cyber stalking.

OR

- 4 a. What are the safety and security measures to be considered while using a computer in a cyber café? (08 Marks)
b. Define botnet. How one can secure the system from botnet attack. (08 Marks)
c. Write a note on attack vector. (04 Marks)

Module-3

- 5 a. What are the differences between proxy server and anonymizer? (05 Marks)
b. What is phishing? Explain how phishing works. (07 Marks)
c. Define virus. Explain different types of viruses. (08 Marks)

OR

- 6 a. What are DoS and DDoS attacks? Explain the types of DoS attack. (10 Marks)
b. Explain traditional techniques of attacks on wireless networks. (10 Marks)

Module-4

- 7 a. Define criminal profiling. Explain different profiling methods. (06 Marks)
b. Discuss any five common misconceptions regarding cybercriminals. (10 Marks)
c. List the common motives for committing cybercrime. (04 Marks)

OR

- 8 a. Explain the ten characteristics of good cyber investigator. (10 Marks)
b. What is Encryption? List different encryption algorithms. (05 Marks)
c. Write a note on Steganography. (05 Marks)

Module-5

- 9 a. Discuss how Firewall logs , Reports , Alarms and Alerts can be used to detect cybercrime attack. (08 Marks)
- b. With the key commands, describe how Domain Name or IP address is traced? (06 Marks)
- c. Define Evidence. Brief on its categories. (06 Marks)

OR

- 10 a. Explain collection and preserving of digital evidence. (06 Marks)
- b. Briefly explain evidence tagging and marking. Also brief on evidence logs. (06 Marks)
- c. What are the different types of data that should be examined for evidence in case of cyber crime? (08 Marks)

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

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

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Why do we test software? Discuss what typical test cases information should include. (07 Marks)
- b. Define software quality. Discuss different types of quality attributed with example. (07 Marks)
- c. Explain the 2 fundamental approaches used to identify test cases. (06 Marks)

OR

- 2 a. State the triangle problem with all conditions along with flowchart for traditional implementation of triangle problem. (10 Marks)
- b. Define testing and debugging with neat diagram explain test and debug cycle. (10 Marks)

Module-2

- 3 a. What is Boundary Value Analysis (BVA)? Interpret the usage of BVA for a function of 2 variables and highlight the limitation of BVA. (06 Marks)
- b. Highlight the guidelines and observations used in equivalence class testing. (06 Marks)
- c. Elaborate in detail about the various classes in equivalence class testing with relevant diagram. (08 Marks)

OR

- 4 a. What is equivalence class testing? Demonstrate weak robust and strong robust equivalence class testing for commission problem. (08 Marks)
- b. Formulate decision table along with test cases for next date function. (08 Marks)
- c. Write guidelines and observations for decision table based testing. (04 Marks)

Module-3

- 5 a. Briefly describe various metric based testing methods used in path testing. (07 Marks)
- b. Define cyclomatic complexity. Explain in detail McCabe's basis path method with an suitable example. (07 Marks)
- c. Draw and explain different types of structural programming constructs used in path testing. (06 Marks)

OR

- 6 a. What is the use of dataflow testing? List and define various terms used in define-use testing. (07 Marks)
- b. Explain slice based testing for commission problem using relevant lattice. (07 Marks)
- c. With neat diagram, discuss Rapps-Weyuker hierarchy of dataflow coverage metrics. (06 Marks)

Module-4

- 7 a. With neat diagram, discuss 3 types of waterfall spin-offs models. (10 Marks)
b. With suitable example, classify different types of decomposition based integration testing. (10 Marks)

OR

- 8 a. Draw and explain decomposition tree and context diagram for SATM machine. (10 Marks)
b. Discuss different types of path integration testing with a suitable example. (10 Marks)

Module-5

- 9 a. Explain the basic set of requirement specification constructs used in system testing with suitable example. (10 Marks)
b. Discuss briefly the different methods of functional strategies used for thread testing. (10 Marks)

OR

- 10 a. List different types of interactions used in interaction testing. Explain any 2 in detail. (10 Marks)
b. With neat diagram, explain the use of client/server testing in interaction testing. (10 Marks)

* * * * *

CBCS SCHEME

USN

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

BAI654D

Sixth Semester B.E./B.Tech. Degree Examination, June/July 2025 Introduction to Artificial Intelligence

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 artificial intelligence, classify the task domains of artificial intelligence.	10	L2	CO1																		
	b.	Construct the state space tree and show one possible solution for the following given initial and goal state of the 8-puzzle problem : <table border="1" style="border-collapse: collapse; width: 100px; height: 100px;"><tr><td>1</td><td>2</td><td>3</td></tr><tr><td>8</td><td>5</td><td>6</td></tr><tr><td>4</td><td>7</td><td></td></tr></table> <i>Initial state/ Configuration (Start)</i> ⇒ <table border="1" style="border-collapse: collapse; width: 100px; height: 100px;"><tr><td>1</td><td>2</td><td>3</td></tr><tr><td>4</td><td>5</td><td>6</td></tr><tr><td>7</td><td>8</td><td></td></tr></table> <i>Goal state/ Configuration (Final)</i>	1	2	3	8	5	6	4	7		1	2	3	4	5	6	7	8		10	L3	CO1
1	2	3																					
8	5	6																					
4	7																						
1	2	3																					
4	5	6																					
7	8																						
OR																							
Q.2	a.	A water jug problem states “you are provided with two jugs, first one with 6-gallon capacity and the second one with 8-gallon capacity. Neither have any measuring markers on it”. How can you get exactly half of water into 8-gallon jug? i) Write down the production rules for the above problem ii) Construct the state space tree with any one possible solution.	10	L4	CO1																		
	b.	Discuss the State of the Art with respect to AI.	2	L3	CO1																		
	c.	Explain in detail generate and Test algorithms.	8	L2	CO1																		
Module – 2																							
Q.3	a.	What are the components of first-order logic? Explain each with an example.	10	L2	CO2																		
	b.	Discuss the forward and backward chaining/reasoning algorithm in propositional logic.	10	L3	CO2																		
OR																							
Q.4	a.	Define the following with examples in respect of sentences in proposition logic, i) Logical equivalence ii) Validity or tautology iii) Satisfiability or contingency iv) Contradiction.	10	L1	CO2																		
	b.	Discuss the resolution in predicate logic algorithm. Write the example also.	10	L3	CO2																		

1 of 2

Module – 3

Q.5	a.	Define quantifier, explain the types of quantifiers with examples.	10	L2	CO3
	b.	What is logic programming? Explain with an appropriate example.	10	L2	CO3

OR

Q.6	a.	Look at the following sentences : i) Marcus was a man ii) Marcus was a Pompeian iii) Marcus was born in 040 AD iv) All men are mortal v) All Pompeian's died in 079 AD vi) No mortal lives for more than 150 years Convert them into predicate logic.	10	L3	CO3
	b.	What do you mean by uncertainty? Discuss briefly the approaches to deal with the same.	10	L3	CO3

Module – 4

Q.7	a.	Explain Minmax search algorithm.	10	L2	CO4
	b.	Explain Alpha Beta pruning Algorithm with example in AI.	10	L2	CO4

OR

Q.8	a.	Discuss the steps /phases of natural language processing with the advantages and disadvantages.	10	L3	CO4
	b.	Write Depth First Search Iterative Deepening Algorithm.	10	L2	CO4

Module – 5

Q.9	a.	Explain various learning techniques with examples.	10	L2	CO5
	b.	Discuss inductive learning with an example.	10	L3	CO5

OR

Q.10	a.	What is an expert system? List and explain various expert systems.	10	L2	CO5
	b.	What is an analogy? Explain deviational analogy.	10	L2	CO5

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) <table><tr><td>CGPA</td><td>Interactiveness</td><td>Practical knowledge</td><td>Communication skills</td><td>Logical thinking</td><td>Job offer</td></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	10	L3
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)

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

- 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)

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 tree 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). **7 L3 CO3**

X	Y	Class
3	1	A
5	2	A
4	3	A
7	6	B
6	7	B
8	5	B

Table Q.6(a)

- 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**

Module – 4

- Q.7** a. Using Naïve bayes classifier classify the new data (Red, SUV, Domestic) using the training dataset given in Table Q.7(a).

Table Q.7(a)

Color	Type	Origin	Stolen
Red	Sports	Domestic	YES
Red	Sports	Domestic	NO
Red	Sports	Domestic	YES
Yellow	Sports	Domestic	NO
Yellow	Sports	Imported	YES
Yellow	SUV	Imported	NO
Yellow	SUV	Imported	YES
Yellow	SUV	Domestic	NO
Red	SUV	Imported	NO
Red	Sports	Imported	YES

- b. Explain the simple model of an artificial neuron along with the artificial neural network structure.

OR

- Q.8** a. Explain Bayes theorem, Maximum A Posteriori (MAP) hypothesis and Maximum Likelihood (ML) hypothesis in detail.

- b. Explain different activation functions used in artificial neural network.

Module – 5

- Q.9** a. Consider the following set of data given in Table Q.9(a). Cluster it using K-means algorithm with initial value of objects 2 and 5 with the coordinate values (4, 6) and (12, 4) as initial seeds.

Table Q.9(a)

Objects	X-coordinate	Y-coordinate
1	2	4
2	4	6
3	6	8
4	10	4
5	12	4



- b. Explain the various components of reinforcement learning.

OR

- Q.10** a. Find the Manhattan and Chebyshev distance if the coordinates of the objects are (0, 3) and (5, 8).

- b. Explain the mean shift clustering algorithm.

- c. List and explain the
 i) Characteristics of reinforcement learning
 ii) Challenges of reinforcement learning
 iii) Applications of reinforcement learning

CBCS SCHEME

USN

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

BCS613D

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

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.	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 Treemap 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

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

Fundamentals of Operating Systems

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 Operating System. Explain dual mode of operating system with a neat diagram.	10	L1 L2	CO1															
	b.	Explain the different computer system architectures.	10	L2	CO1															
OR																				
Q.2	a.	List and explain the services of the operating system with respect to programs and the users.	10	L2	CO1															
	b.	What are system calls? List and explain the different types of system calls.	10	L1 L2	CO1															
Module – 2																				
Q.3	a.	Define Process. Explain different states of a process with state diagram.	10	L1 L2	CO1															
	b.	Define IPC. Explain shared memory and message passing mechanisms.	10	L1 L2	CO1															
OR																				
Q.4	a.	Explain the following : i) Context switching ii) Process creation iii) Process termination	10	L2	CO1															
	b.	Describe the various multithreading models and discuss the benefits of multithreaded programming.	10	L2	CO1															
Module – 3																				
Q.5	a.	Define Turn-around time, Response time and CPU utilization.	06	L1	CO2															
	b.	Calculate the average waiting time and average turn around time by drawing Gantt-chart using FCFS, SJF, Priority (lowest number has higher priority) and RR (Q = 2 ms) <table border="1"><thead><tr><th>Process</th><th>Burst Time</th><th>Priority</th></tr></thead><tbody><tr><td>P₁</td><td>10</td><td>3</td></tr><tr><td>P₂</td><td>1</td><td>2</td></tr><tr><td>P₃</td><td>2</td><td>1</td></tr><tr><td>P₄</td><td>4</td><td>4</td></tr></tbody></table>	Process	Burst Time	Priority	P ₁	10	3	P ₂	1	2	P ₃	2	1	P ₄	4	4	14	L3	CO2
Process	Burst Time	Priority																		
P ₁	10	3																		
P ₂	1	2																		
P ₃	2	1																		
P ₄	4	4																		
OR																				
Q.6	a.	What is critical section? What are the requirements for the solution to critical section problem? Explain Peterson's solution.	10	L1 L2	CO3															
	b.	What is semaphore? Discuss the solution to the classical dining philosopher problem using semaphore.	10	L1 L2	CO3															

1 of 2

Module – 4

Module – 4

Q.7	a.	What is a Deadlock? What are the necessary conditions for the deadlock to occur?	10	L1 L2	CO3																																																																				
	b.	Consider the following snap shot of the system: <table border="1" style="margin: 10px auto;"><thead><tr><th rowspan="2">Process</th><th colspan="3">Allocation</th><th colspan="3">Max</th><th colspan="3">Available</th></tr><tr><th>R₁</th><th>R₂</th><th>R₃</th><th>R₁</th><th>R₂</th><th>R₃</th><th>R₁</th><th>R₂</th><th>R₃</th></tr></thead><tbody><tr><td>P₁</td><td>0</td><td>1</td><td>0</td><td>7</td><td>5</td><td>3</td><td>3</td><td>2</td><td>2</td></tr><tr><td>P₂</td><td>2</td><td>0</td><td>0</td><td>3</td><td>2</td><td>2</td><td></td><td></td><td></td></tr><tr><td>P₃</td><td>3</td><td>0</td><td>2</td><td>9</td><td>0</td><td>2</td><td></td><td></td><td></td></tr><tr><td>P₄</td><td>2</td><td>1</td><td>1</td><td>2</td><td>2</td><td>2</td><td></td><td></td><td></td></tr><tr><td>P₅</td><td>0</td><td>0</td><td>2</td><td>4</td><td>3</td><td>3</td><td></td><td></td><td></td></tr></tbody></table> Apply Banker's algorithm to answer the following : i) What is the content of the need matrix? ii) Is the system in a safe state? If so, find a safe sequence.	Process	Allocation			Max			Available			R ₁	R ₂	R ₃	R ₁	R ₂	R ₃	R ₁	R ₂	R ₃	P ₁	0	1	0	7	5	3	3	2	2	P ₂	2	0	0	3	2	2				P ₃	3	0	2	9	0	2				P ₄	2	1	1	2	2	2				P ₅	0	0	2	4	3	3				10	L3
Process	Allocation			Max			Available																																																																		
	R ₁	R ₂	R ₃	R ₁	R ₂	R ₃	R ₁	R ₂	R ₃																																																																
P ₁	0	1	0	7	5	3	3	2	2																																																																
P ₂	2	0	0	3	2	2																																																																			
P ₃	3	0	2	9	0	2																																																																			
P ₄	2	1	1	2	2	2																																																																			
P ₅	0	0	2	4	3	3																																																																			

OR

Q.8	a.	What is paging? Explain TLB in detail with a simple paging system and neat diagram.	10	L1 L2	CO4
	b.	What is fragmentation? Differentiate internal fragmentation and external fragmentation.	10	L1 L4	CO4

Module – 5

Q.9	a.	What is page fault? With a neat diagram explain steps in handling page fault.	10	L1 L2	CO4
	b.	Consider the page reference string for a memory with three frames. Determine the number of page faults using FIFO and LRU page replacement algorithms. 7, 0, 1, 2, 0, 3, 0, 4, 2, 3 ; 0, 3, 2, 1, 2, 0, 1, 7, 0, 1	10	L3	CO4

OR

Q.10	a.	Define file. Explain the different file allocation methods.	10	L1 L2	CO5
	b.	Explain the following : i) Protection ii) File sharing iii) File system mounting	10	L2	CO5

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

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

BIS601

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						

	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 on image and add a mouseover event listener to change its border color. Add on 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					

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

