

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

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.	10	L3	CO2																														
Table Q.3(b)																																			
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>CGPA</th> <th>Interactiveness</th> <th>Practical knowledge</th> <th>Communication skills</th> <th>Logical thinking</th> <th>Job offer</th> </tr> </thead> <tbody> <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> </tbody> </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																														

- 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)	10	L3	CO4																																												
<table border="1"> <thead> <tr> <th>Color</th> <th>Type</th> <th>Origin</th> <th>Stolen</th> </tr> </thead> <tbody> <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> </tbody> </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			
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)	10	L3	CO5																		
<table border="1"> <thead> <tr> <th>Objects</th> <th>X-coordinate</th> <th>Y-coordinate</th> </tr> </thead> <tbody> <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> </tbody> </table>			Objects	X-coordinate	Y-coordinate	1	2	4	2	4	6	3	6	8	4	10	4	5	12	4			
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 - Make-Up Exam

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.	Explain scalable computing over the internet.	10	L2	CO1
	b.	Discuss internet of things and cyber-physical systems.	10	L2	CO1
OR					
Q.2	a.	Discuss system models for distributed and cloud computing.	10	L2	CO1
	b.	Explain performance, security and energy efficiency.	10	L2	CO1
Module – 2					
Q.3	a.	Discuss levels of virtualization implementation.	10	L2	CO2
	b.	Discuss full virtualization and para virtualization.	6	L2	CO2
	c.	Explain CPV and memory virtualization.	4	L2	CO2
OR					
Q.4	a.	Explain virtualization structure/tools and mechanisms.	10	L2	CO2
	b.	Discuss virtualization for data center automation.	10	L2	CO2
Module – 3					
Q.5	a.	Explain cloud computing and service models with neat diagram.	10	L2	CO3
	b.	Discuss Data Center Networking Structure with neat diagram.	10	L2	CO3
OR					
Q.6	a.	Explain Data-center construction requirements.	10	L2	CO3
	b.	Explain the following: i) GAE ii) AWS	10	L2	CO3
Module – 4					
Q.7	a.	Explain cloud security risks and discuss types of attacks in a cloud computing environment.	10	L2	CO4
	b.	Explain privacy impact assessment in cloud computing.	10	L2	CO4
1 of 2					

BIS613D					
OR					
Q.8	a.	Discuss security risks posed by shared images and management OS.	10	L3	CO4
	b.	Explain data and software protection techniques.	10	L3	CO4
Module – 5					
Q.9	a.	Explain programming support for Google App Engine.	10	L3	CO5
	b.	Discuss features of cloud and grid.	10	L2	CO5
OR					
Q.10	a.	Discuss parallel computing and programming paradigms.	10	L3	CO5
	b.	Explain programming on Amazon AWS and Microsoft azure.	10	L3	CO5

CBCS SCHEME - Make-Up Exam

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
1	a.	What is Artificial Intelligence? Explain the Mundane, Formal and Expert task domains of AI.	10	L2	CO1
	b.	Given two jugs, 1 4 – gallon and 3 – gallon without any measuring markers. There is a pump to fill the jugs with water. How can you get exactly 2 – gallons of water into the 4 – gallon jug. Write the production Rules and the solution.	10	L3	CO1
OR					
2	a.	Describe the Breadth – First search and Dept – First search algorithm with trees.	10	L2	CO1
	b.	Explain the Tic – Tac – Toe game and any one program to solve it.	10	L2	CO1
Module – 2					
3	a.	With a diagram, explain the mappings between facts and representations.	8	L2	CO2
	b.	Explain the following knowledge representation schemes with examples: i) Relational knowledge ii) Inheritable knowledge iii) Inferential knowledge iv) Declarative knowledge	12	L2	CO2
OR					
4	a.	Represent the following sentences in predicate logic: i) Marcus was a man ii) Marcus was a Pompeian iii) All pompeians were Romans iv) Caesar was a ruler v) All Romans were either loyal to Caesar or hated him vi) Everyone is loyal to someone vii) People only try to assassinate rulers they are not loyal to viii) Marcus tried to assassinate Caesar	10	L3	CO2
	b.	Write the algorithm to convert predicate logic to clausal Normal Form.	10	L3	CO2
Module – 3					
5	a.	What are Non – Monotonic reasoning systems? Explain from the context of ABC murder story.	10	L2	CO3
	b.	Explain the Baye's Theorem and Bayesian Networks.	10	L2	CO3
OR					
6	a.	Write a short note on Dempster Shafer Theory.	10	L2	CO3
	b.	Describe the justification – based Truth Maintenance System with example.	10	L2	CO3

Module – 4

7	a.	Write the MiniMax Algorithm, explain with example.	10	L2	CO4
	b.	What do you mean by Natural Language Processing? Explain the various steps in Natural Language Processing.	10	L2	CO4

OR

8	a.	Explain Top –down and Bottom – up parsing of sentences using grammars.	10	L2	CO4
	b.	Derive the parse Tree for the following sentences using the grammar in Top down approach: Grammar : i) $S \rightarrow NP VP$ ii) $NP \rightarrow ART N$ iii) $NP \rightarrow ART ADJ N$ iv) $VP \rightarrow V$ v) $VP \rightarrow V NP$ 1) Derive the sentence "The dogs cried" 2) Derive the sentence "The old man cried".	10	L3	CO4

Module – 5

9	a.	Describe Rote Learning and Learning by Taking Advice.	10	L2	CO5
	b.	With a neat diagram, explain the Expert System Shells.	10	L2	CO5

OR

10	a.	Describe the Expert Systems and explain representing and using Domain knowledge.	10	L2	CO5
	b.	Write a short note on : i) Version space ii) Decision Trees	10	L2	CO5
