

CBCS SCHEME - Make-Up Exam

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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.	Discuss the evolution and applications of high performance and high throughput system.	10	L2	CO1
	b.	Explain multithreading technology with respect to five micro architecture in modern CPU processors.	10	L2	CO1
OR					
Q.2	a.	Discuss the fundamental components and working principles of modern multicore processor with a neat diagram.	10	L2	CO1
	b.	Compare different virtual machine architecture : Native VM, hosted VM and dual mode VM with physical machine model also discuss VM primitive operations.	10	L2	CO1
Module - 2					
Q.3	a.	Define Virtualization. Explain five abstraction levels of virtualization with a neat diagram.	10	L2	CO2
	b.	Define Hypervisor. With a neat diagram, explain Xen architecture.	10	L2	CO2
OR					
Q.4	a.	Explain in detail Virtualization in multicore processors with a neat diagram.	10	L2	CO2
	b.	Define Live Migration. Explain live migration steps and performance effects.	10	L2	CO2
Module - 3					
Q.5	a.	Discuss Public, Private and Hybrid clouds. Explain the classification of cloud based on the types of services offered.	10	L2	CO3
	b.	With a neat diagram, explain generic cloud architecture.	10	L2	CO3
OR					
Q.6	a.	Explain different types of architectural design challenges.	10	L2	CO3
	b.	With a neat diagram, explain any two public cloud platforms.	10	L2	CO3

Module – 4

Q.7	a.	Discuss Top Security Concerns and Security risks faced by cloud users.	10	L2	CO4
	b.	Explain different types of cloud data encryption method.	10	L2	CO4

OR

Q.8	a.	With a neat diagram, explain virtual security services provided by hypervisor.	10	L2	CO4
	b.	With a neat diagram, explain the corresponding security measures taken at each cloud service models.	10	L2	CO4

Module – 5

Q.9	a.	Summarize different features of cloud and grid platforms.	10	L2	CO5
	b.	With a neat diagram, explain map reduce framework and overall structure of map reduce program.	10	L2	CO5

OR

Q.10	a.	Design a program using map reduce functions to count number of occurrences of each word in a sentence i) Most-people ignore most poetry ii) Most poetry ignores most people	10	L3	CO5
	b.	With a neat diagram, explain the architecture and data mutation sequence in Google File System (GFS).	10	L2	CO5

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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%; 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 style="text-align: center;">≥ 9</td> <td style="text-align: center;">Yes</td> <td style="text-align: center;">Excellent</td> <td style="text-align: center;">Good</td> <td style="text-align: center;">Fast</td> <td style="text-align: center;">YES</td> </tr> <tr> <td style="text-align: center;">≥ 9</td> <td style="text-align: center;">Yes</td> <td style="text-align: center;">Good</td> <td style="text-align: center;">Good</td> <td style="text-align: center;">Fast</td> <td style="text-align: center;">YES</td> </tr> <tr> <td style="text-align: center;">≥ 8</td> <td style="text-align: center;">No</td> <td style="text-align: center;">Good</td> <td style="text-align: center;">Good</td> <td style="text-align: center;">Fast</td> <td style="text-align: center;">NO</td> </tr> <tr> <td style="text-align: center;">≥ 9</td> <td style="text-align: center;">Yes</td> <td style="text-align: center;">Good</td> <td style="text-align: center;">Good</td> <td style="text-align: center;">Slow</td> <td style="text-align: center;">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
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≥ 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

10 L3 CO2

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

6 L3 CO3

- 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).

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)

7 L3 CO3

- 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

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BCS613A

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

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 Blockchain and explain centralized, decentralized and distributed systems with a suitable diagram.	05	L2	CO1
	b.	Explain the generic structure of a block with a diagram.	05	L2	CO1
	c.	Discuss the growth of the blockchain with an Architecture / network view of blockchain with a neat diagram.	10	L2	CO1
OR					
Q.2	a.	Illustrate the Byzantine General Problem with a suitable example.	05	L2	CO1
	b.	Describe about CAP theorem in block chain.	05	L2	CO1
	c.	Why are Consensus Algorithm needed in Blockchain? Explain in detail.	10	L2	CO1
Module - 2					
Q.3	a.	Explain the methods of decentralization in detail.	10	L2	CO2
	b.	Write an algorithm for working of SHA- 256	10	L3	CO2
OR					
Q.4	a.	Write the steps involved in RSA key pair generation with an example.	10	L3	CO2
	b.	Illustrate with a diagram point addition in Elliptic Curve Cryptography.	10	L2	CO2
Module - 3					
Q.5	a.	Explain transaction life cycle in a Bit coin system.	10	L2	CO3
	b.	Discuss the different types of transaction in Bit Coin.	10	L3	CO3
OR					
Q.6	a.	What is the wallet in bit coin? Explain in detail about the different types of wallet with example.	10	L2	CO3
	b.	Write a short note on : Privacy and Anonymity.	10	L2	CO3
Module - 4					
Q.7	a.	What are the two types of accounts that exists in Ethereum. Explain.	10	L2	CO4
	b.	With a neat bowtie model diagram explain Ricardian contracts.	10	L2	CO4
OR					
Q.8	a.	Explain any five standard fields in Ethereum transaction.	10	L2	CO4
	b.	Write a short note on Ethereum virtual machine.	10	L2	CO4
Module - 5					
Q.9	a.	Explain the architecture and key components of Hyperledger Fabric.	10	L2	CO5
	b.	Compare and contrast Hyperledger Fabric and Hyperledger sawtooth in terms of architecture consensus and user.	10	L3	CO5
OR					
Q.10	a.	What is Hyperledger? Discuss its objectives, structure as a protocol suite and list key projects under the hyperledger umbrella with a brief description of each.	10	L2	CO5
	b.	Discuss the architecture of corda. What makes it suitable for financial institutions and how does it handle consensus and privacy?	10	L3	CO5

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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

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
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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
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

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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

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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 : <div style="display: flex; justify-content: space-around; align-items: center;"> <table border="1" style="border-collapse: collapse; text-align: center;"> <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> → <table border="1" style="border-collapse: collapse; text-align: center;"> <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> </div> <div style="display: flex; justify-content: space-around; margin-top: 10px;"> <div style="text-align: center;"> <p><i>Initial state/ Configuration (Start)</i></p> </div> <div style="text-align: center;"> <p><i>Goal state/ Configuration (Final)</i></p> </div> </div>	1	2	3	8	5	6	4	7		1	2	3	4	5	6	7	8		10	L3
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																	

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