



BMS INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(An Autonomous Institution, Affiliated to VTU Belagavi)
Avalahalli, Doddaballapur Main Road, Bengaluru - 560064

FIRST INTERNAL ASSESSMENT TEST, JANUARY 2023

Name of the Course

Machine Learning

Course
Code

21MCA301

Branch & Semester

MCA & III Sem

Date

19.01.2023

Name of the Course
Coordinator (s)

Dr. Aparna K

Max. Marks

40

Note: Answer THREE full questions from Part A and Part B questions are compulsory.

Qn. No.	PART A								Marks	CO																																								
1.	There are several steps involved in designing a Learning system. Elaborate on the design choices of choosing the training experience and choosing the target function.								8 M	CO1 K2																																								
	OR																																																	
2.	What do you mean by a Consistent Hypothesis? Check whether the given hypothesis $h_4 = \{\text{Sunny, Warm, ?, Strong, ?, ?}\}$ is consistent or not with respect to the following dataset which depicts whether Alex enjoys playing the sport or not on a particular day:								8 M	CO1 K2																																								
	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Ex.</th><th>Sky</th><th>AirTemp</th><th>Humidity</th><th>Wind</th><th>Water</th><th>Forecast</th><th>Enjoy Sport</th></tr> </thead> <tbody> <tr> <td>1.</td><td>Sunny</td><td>Warm</td><td>Normal</td><td>Strong</td><td>Warm</td><td>Same</td><td>Yes</td></tr> <tr> <td>2.</td><td>Sunny</td><td>Warm</td><td>High</td><td>Strong</td><td>Warm</td><td>Same</td><td>Yes</td></tr> <tr> <td>3.</td><td>Rainy</td><td>Cold</td><td>High</td><td>Strong</td><td>Warm</td><td>Change</td><td>No</td></tr> <tr> <td>4.</td><td>Sunny</td><td>Warm</td><td>High</td><td>Strong</td><td>Cool</td><td>Change</td><td>Yes</td></tr> </tbody> </table>								Ex.	Sky	AirTemp	Humidity	Wind	Water	Forecast	Enjoy Sport	1.	Sunny	Warm	Normal	Strong	Warm	Same	Yes	2.	Sunny	Warm	High	Strong	Warm	Same	Yes	3.	Rainy	Cold	High	Strong	Warm	Change	No	4.	Sunny	Warm	High	Strong	Cool	Change	Yes		
Ex.	Sky	AirTemp	Humidity	Wind	Water	Forecast	Enjoy Sport																																											
1.	Sunny	Warm	Normal	Strong	Warm	Same	Yes																																											
2.	Sunny	Warm	High	Strong	Warm	Same	Yes																																											
3.	Rainy	Cold	High	Strong	Warm	Change	No																																											
4.	Sunny	Warm	High	Strong	Cool	Change	Yes																																											
3.	ID3 is a widely used Decision tree algorithm that uses a top-down greedy approach to build a decision tree i.e., we start building the tree from the top and at each iteration we select the best feature to create a node. Given this understanding about the ID3, apply the same to the following data set in order to build a Decision tree:								8 M	CO2 K2																																								
	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Instance</th><th>Classification</th><th>a_1</th><th>a_2</th></tr> </thead> <tbody> <tr> <td>1</td><td>+</td><td>T</td><td>T</td></tr> <tr> <td>2</td><td>+</td><td>T</td><td>T</td></tr> <tr> <td>3</td><td>-</td><td>T</td><td>F</td></tr> <tr> <td>4</td><td>+</td><td>F</td><td>F</td></tr> <tr> <td>5</td><td>-</td><td>F</td><td>T</td></tr> <tr> <td>6</td><td>-</td><td>F</td><td>T</td></tr> </tbody> </table>								Instance	Classification	a_1	a_2	1	+	T	T	2	+	T	T	3	-	T	F	4	+	F	F	5	-	F	T	6	-	F	T														
Instance	Classification	a_1	a_2																																															
1	+	T	T																																															
2	+	T	T																																															
3	-	T	F																																															
4	+	F	F																																															
5	-	F	T																																															
6	-	F	T																																															
	OR																																																	
4.	Give the general representation of a Decision Tree. Support your answer with suitable examples.								8 M	CO2 K2																																								
5.	The LIST-THEN-ELIMINATE algorithm first initializes the version space to contain all hypotheses in H and then eliminates any hypothesis found inconsistent with any training example. Write a code for the same and illustrate with a suitable example.								8 M	CO1 K2																																								
	OR																																																	
6.	Designing a Learning System involves steps comprising from choosing the training experience and moving on to the final design. Elaborate on all the components comprising the final design of the learning system.								8 M	CO1 K2																																								



BMS INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(An Autonomous Institution, Affiliated to VTU Belagavi)

Avalahalli, Doddaballapur Main Road, Bengaluru - 560064

SECOND INTERNAL ASSESSMENT TEST, FEBRUARY 2023

Name of the Course
Branch & Semester
Name of the Course
Coordinator (s)

Machine Learning
MCA & III Sem
Dr. Aparna K

Course Code
Date
Max. Marks

21MCA301
20.02.2023
40

Note: Answer THREE full questions from Part A and Part B questions are compulsory.

Qn. No.	PART A	Marks	CO
1.	Implementing Decision tree algorithm involves dealing with several issues, one of them being overfitting the data. Present your understanding about overfitting the data with Decision tree learning and how it can be avoided.	8 M	CO2 K2
2.	OR There are several issues to be considered while implementing Decision Tree algorithm. One of them is to deal with discrete set of attributes and continuous-valued attributes. Elaborate on how continuous-valued attributes can be incorporated in ID3 with suitable examples.	8 M	CO2 K2
3.	A neural network is a method in artificial intelligence that teaches computers to process data in a way that is inspired by the human brain. With this background of Neural Network learning, elaborate on the appropriate problems for the same.	8 M	CO1 K2
4.	OR Define Perceptron. Explain the concept of single perceptron with neat diagram.	8 M	CO1 K2
5.	Discuss the perceptron training rule, Gradient Descent and delta rule that solves the learning problem of perceptron.	8 M	CO1 K2
6.	OR Backpropagation is an iterative, recursive and efficient algorithm through which it calculates the updated weight to improve the network until it is able to perform the task for which it is being trained. Given this context, present the Back propagation algorithm for feed forward networks containing two layers of sigmoid units.	8 M	CO1 K2
7.	PART B A brute force approach is an approach that finds all the possible solutions to find a satisfactory solution to a given problem. Based on this generic idea of brute force, bring out the relationship between Bayes theorem and concept learning with the help of Brute-Force MAP Learning algorithm.	8 M	CO4 K3
8.	Derive an equation for MAP hypothesis and apply the same to the following scenario: Consider a medical diagnosis problem in which there are two alternative hypotheses: a) that the patient has a particular form of cancer b) that the patient does not have. The available data is from a particular laboratory test with two possible outcomes: + (positive) and - (negative). There is prior knowledge that over the entire population of people only 0.008 have this disease. The test returns a correct positive result in only 98% of the cases in which the disease is actually present and a correct negative result in only 97% of the cases in which the disease is not present. Suppose we now observe a new patient for whom the lab test returns a positive result. Should we diagnose the patient as having cancer or not?	8 M	CO4 K3

CO1	Design the process of learning models from data.
CO2	Build suitable Decision tree for a given data set.
CO3	Apply machine learning algorithms for the given problems.
CO4	Perform statistical and probabilistic analysis of machine learning techniques.
CO5	Implement machine learning algorithms for a given use case.

Do. Aparna 6/2/2023	Dr. Aparna 6/2/2023	Dr. Aparna 6/2/2023	Head of the Department 6/2/2023
Course Coordinator(s)	Module Coordinator(s)	Program Coordinator	Head of the Department



BMS INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(An Autonomous Institution, Affiliated to VTU Belagavi)
Avalahalli, Doddaballapur Main Road, Bengaluru - 560064

THIRD INTERNAL ASSESSMENT TEST, MARCH 2023

Name of the Course
Branch & Semester
Name of the Course
Coordinator (s)

Machine Learning
MCA & III Sem
Dr. Aparna K

Course Code
Date
Max. Marks

21MCA301
20.03.2023
40

Note: Answer THREE full questions from Part A and Part B questions are compulsory.

Qn. No.	PART A							Marks	CO																																										
1.	Bayesian ML is a paradigm for constructing statistical models based on Bayes' Theorem. In this context, summarize the features of Bayesian Learning methods.							8 M	CO4 K2																																										
	OR																																																		
2.	Define Sample Error, True Error, Confidence Intervals, Estimation Bias with suitable examples.							8 M	CO4 K2																																										
3.	<p>Naïve Bayes Classifier is one of the simple and most effective Classification algorithms which helps in building machine learning models that can make quick predictions. Apply Naïve Bayes classifier to classify the given new instance. New Instance: (USA, Honda, Green, 1970, Sports)</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Ex.</th> <th>Origin</th> <th>Manufacturer</th> <th>Color</th> <th>Decade</th> <th>Type</th> <th>Target Concept</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Japan</td> <td>Honda</td> <td>Blue</td> <td>1980</td> <td>Economy</td> <td>+</td> </tr> <tr> <td>2</td> <td>Japan</td> <td>Toyota</td> <td>Green</td> <td>1970</td> <td>Sports</td> <td>-</td> </tr> <tr> <td>3</td> <td>Japan</td> <td>Toyota</td> <td>Blue</td> <td>1990</td> <td>Economy</td> <td>+</td> </tr> <tr> <td>4</td> <td>USA</td> <td>Chrysler</td> <td>Red</td> <td>1980</td> <td>Economy</td> <td>-</td> </tr> <tr> <td>5</td> <td>Japan</td> <td>Honda</td> <td>White</td> <td>1980</td> <td>Economy</td> <td>+</td> </tr> </tbody> </table>							Ex.	Origin	Manufacturer	Color	Decade	Type	Target Concept	1	Japan	Honda	Blue	1980	Economy	+	2	Japan	Toyota	Green	1970	Sports	-	3	Japan	Toyota	Blue	1990	Economy	+	4	USA	Chrysler	Red	1980	Economy	-	5	Japan	Honda	White	1980	Economy	+	8 M	CO3 K2
Ex.	Origin	Manufacturer	Color	Decade	Type	Target Concept																																													
1	Japan	Honda	Blue	1980	Economy	+																																													
2	Japan	Toyota	Green	1970	Sports	-																																													
3	Japan	Toyota	Blue	1990	Economy	+																																													
4	USA	Chrysler	Red	1980	Economy	-																																													
5	Japan	Honda	White	1980	Economy	+																																													
	OR																																																		
4.	What is MDL Principle? Derive an expression for the same.							8 M	CO3 K2																																										
5.	Discuss the role of confidence intervals for discrete-valued hypothesis in measuring the goodness of true-error estimate when the sample error is provided.							8 M	CO1 K2																																										
	OR																																																		
6.	Instance-based learning refers to a family of techniques for classification and regression, which produce a class label/prediction based on the similarity of the query to its nearest neighbour(s) in the training set. In this context, write in detail about the K-Nearest Neighbour algorithm and its approach to perform classification. Support your answer with suitable example and illustration.							8 M	CO1 K2																																										
	PART B																																																		
7.	A new burglar alarm is installed in my home. The alarm will beep if there is a burglary at home or if and when an earthquake occurs. Whenever the alarm beeps, two of my friends J and M will call me to inform the same. Depict the same using a Bayesian Belief network with appropriate conditional probability tables.							8 M	CO4 K3																																										
8.	Suppose we are given two learning algorithms, L_A and L_B . The objective is to compare the performance of these two algorithms. What is an appropriate test for comparing learning algorithms, and how can we determine whether an observed difference between the algorithms is statistically significant?							8 M	CO4 K3																																										

CO1	Design the process of learning models from data.
CO2	Build suitable Decision tree for a given data set.
CO3	Apply machine learning algorithms for the given problems.
CO4	Perform statistical and probabilistic analysis of machine learning techniques.
CO5	Implement machine learning algorithms for a given use case.

Dr. Aparna 11/3/2023
Course Coordinator(s)

Dr. Aparna 11/3/2023
Module Coordinator(s)

Dr. Aparna 11/3/2023
Program Coordinator

Head of the Department
Dr. Aparna 11/3/2023

USN 1 B Y 2 I M C O 4 8

BMS INSTITUTE OF TECHNOLOGY AND MANAGEMENT(An Autonomous Institute affiliated to Visvesvaraya Technological University, Belagavi)
SEMESTER END EXAMINATION QUESTION PAPER**Third Semester MCA Degree Examination**

Regular / Make-up / Arrears / Supplementary

MACHINE LEARNING

Time: 3 hrs.

Max. Marks: 100

Note: 1. Answer FIVE full questions, choosing ONE full question from each module.

Q. No	Module - 1					Marks	CO, RBT																																															
1a.	There are several steps involved in designing a Learning system. Elaborate on the design choices of choosing the training experience and choosing the target function.					10	CO1, K2																																															
b.	The learning problems are always defined with respect to Tasks, Performance and Experience. Describe the following problems with respect to the same: i) Checkers learning problem ii) Handwritten Recognition problem iii) Robot Driving Learning problem					6	CO1, K2																																															
c.	Elaborate on the issues involved in Machine Learning.					4	CO1, K2																																															
OR																																																						
2a.	Define Concept and Concept Learning. Write the notation for most general hypothesis and most specific hypothesis.					4	CO1, K2																																															
b.	The Find-S algorithm is a basic concept learning algorithm in machine learning which finds the most-specific hypothesis that fits all the positive examples. Write a code for the Find-S algorithm and apply the same to the following dataset containing data about poisonous seeds in order to determine the most-specific hypothesis:					6	CO1, K2																																															
<table border="1"> <thead> <tr> <th>Ex.</th> <th>Color</th> <th>Toughness</th> <th>Fungus</th> <th>Appearance</th> <th>Poisonous (Target Concept)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Green</td> <td>Hard</td> <td>No</td> <td>Wrinkled</td> <td>Yes</td> </tr> <tr> <td>2</td> <td>Green</td> <td>Hard</td> <td>Yes</td> <td>Smooth</td> <td>No</td> </tr> <tr> <td>3</td> <td>Brown</td> <td>Soft</td> <td>No</td> <td>Wrinkled</td> <td>No</td> </tr> <tr> <td>4</td> <td>Orange</td> <td>Hard</td> <td>No</td> <td>Wrinkled</td> <td>Yes</td> </tr> <tr> <td>5</td> <td>Green</td> <td>Soft</td> <td>Yes</td> <td>Smooth</td> <td>Yes</td> </tr> <tr> <td>6</td> <td>Green</td> <td>Hard</td> <td>Yes</td> <td>Wrinkled</td> <td>Yes</td> </tr> <tr> <td>7</td> <td>Orange</td> <td>Hard</td> <td>No</td> <td>Wrinkled</td> <td>Yes</td> </tr> </tbody> </table>							Ex.	Color	Toughness	Fungus	Appearance	Poisonous (Target Concept)	1	Green	Hard	No	Wrinkled	Yes	2	Green	Hard	Yes	Smooth	No	3	Brown	Soft	No	Wrinkled	No	4	Orange	Hard	No	Wrinkled	Yes	5	Green	Soft	Yes	Smooth	Yes	6	Green	Hard	Yes	Wrinkled	Yes	7	Orange	Hard	No	Wrinkled	Yes
Ex.	Color	Toughness	Fungus	Appearance	Poisonous (Target Concept)																																																	
1	Green	Hard	No	Wrinkled	Yes																																																	
2	Green	Hard	Yes	Smooth	No																																																	
3	Brown	Soft	No	Wrinkled	No																																																	
4	Orange	Hard	No	Wrinkled	Yes																																																	
5	Green	Soft	Yes	Smooth	Yes																																																	
6	Green	Hard	Yes	Wrinkled	Yes																																																	
7	Orange	Hard	No	Wrinkled	Yes																																																	

c.	<p>The candidate elimination algorithm incrementally builds the version space given a hypothesis space H and a set E of examples. Illustrate the steps with the help of an algorithm and apply the same to the following dataset which describes the features of a species:</p> <table border="1" data-bbox="276 451 1100 693"> <thead> <tr> <th>Ex.</th><th>Eyes</th><th>Nose</th><th>Head</th><th>FColor</th><th>Hair</th><th>Smile (Target Concept)</th></tr> </thead> <tbody> <tr><td>1</td><td>Round</td><td>Triangle</td><td>Round</td><td>Purple</td><td>Yes</td><td>Yes</td></tr> <tr><td>2</td><td>Square</td><td>Square</td><td>Square</td><td>Green</td><td>Yes</td><td>No</td></tr> <tr><td>3</td><td>Square</td><td>Triangle</td><td>Round</td><td>Yellow</td><td>Yes</td><td>Yes</td></tr> <tr><td>4</td><td>Round</td><td>Triangle</td><td>Round</td><td>Green</td><td>No</td><td>No</td></tr> <tr><td>5</td><td>Square</td><td>Square</td><td>Round</td><td>Yellow</td><td>Yes</td><td>Yes</td></tr> </tbody> </table>	Ex.	Eyes	Nose	Head	FColor	Hair	Smile (Target Concept)	1	Round	Triangle	Round	Purple	Yes	Yes	2	Square	Square	Square	Green	Yes	No	3	Square	Triangle	Round	Yellow	Yes	Yes	4	Round	Triangle	Round	Green	No	No	5	Square	Square	Round	Yellow	Yes	Yes	10	CO1, K2
Ex.	Eyes	Nose	Head	FColor	Hair	Smile (Target Concept)																																							
1	Round	Triangle	Round	Purple	Yes	Yes																																							
2	Square	Square	Square	Green	Yes	No																																							
3	Square	Triangle	Round	Yellow	Yes	Yes																																							
4	Round	Triangle	Round	Green	No	No																																							
5	Square	Square	Round	Yellow	Yes	Yes																																							
Module – 2																																													
3a.	<p>A decision tree is a non-parametric supervised learning algorithm, which is utilized for both classification and regression tasks. It has a hierarchical tree structure, which consists of a root node, branches, internal nodes and leaf nodes. Given this representation of a decision tree, elaborate on the appropriate problems that can be solved by Decision tree learning.</p>	8	CO2, K2																																										
b.	<p>ID3 is a classification algorithm that follows a greedy approach of building a decision tree by selecting a best attribute that yields maximum Information Gain (IG) or minimum Entropy (H). Apply the same for the following data set to build a suitable decision tree:</p> <table border="1" data-bbox="409 1084 979 1296"> <thead> <tr> <th>Ex.</th><th>Size</th><th>Color</th><th>Shape</th><th>Target Concept</th></tr> </thead> <tbody> <tr><td>1</td><td>Big</td><td>Red</td><td>Circle</td><td>No</td></tr> <tr><td>2</td><td>Small</td><td>Red</td><td>Triangle</td><td>No</td></tr> <tr><td>3</td><td>Small</td><td>Red</td><td>Circle</td><td>Yes</td></tr> <tr><td>4</td><td>Big</td><td>Blue</td><td>Circle</td><td>No</td></tr> <tr><td>5</td><td>Small</td><td>Blue</td><td>Circle</td><td>Yes</td></tr> </tbody> </table>	Ex.	Size	Color	Shape	Target Concept	1	Big	Red	Circle	No	2	Small	Red	Triangle	No	3	Small	Red	Circle	Yes	4	Big	Blue	Circle	No	5	Small	Blue	Circle	Yes	12	CO2, K2												
Ex.	Size	Color	Shape	Target Concept																																									
1	Big	Red	Circle	No																																									
2	Small	Red	Triangle	No																																									
3	Small	Red	Circle	Yes																																									
4	Big	Blue	Circle	No																																									
5	Small	Blue	Circle	Yes																																									
OR																																													
4a.	<p>Consider the following set of training examples:</p> <table border="1" data-bbox="452 1372 927 1641"> <thead> <tr> <th>Instance</th><th>Classification</th><th>a₁</th><th>a₂</th></tr> </thead> <tbody> <tr><td>1</td><td>+</td><td>T</td><td>T</td></tr> <tr><td>2</td><td>+</td><td>T</td><td>T</td></tr> <tr><td>3</td><td>-</td><td>T</td><td>F</td></tr> <tr><td>4</td><td>+</td><td>F</td><td>F</td></tr> <tr><td>5</td><td>-</td><td>F</td><td>T</td></tr> <tr><td>6</td><td>-</td><td>F</td><td>T</td></tr> </tbody> </table> <p>i) What is the collection of training examples with respect to the classification?</p>	Instance	Classification	a ₁	a ₂	1	+	T	T	2	+	T	T	3	-	T	F	4	+	F	F	5	-	F	T	6	-	F	T	8	CO2, K2														
Instance	Classification	a ₁	a ₂																																										
1	+	T	T																																										
2	+	T	T																																										
3	-	T	F																																										
4	+	F	F																																										
5	-	F	T																																										
6	-	F	T																																										
entropy of this target function																																													

	ii) What is the information gain of a_2 relative to these training examples?																																																									
b.	There are several issues to be considered while implementing Decision Tree algorithm. One of them is to deal with discrete set of attributes and continuous-valued attributes. Elaborate on how continuous-valued attributes can be incorporated in ID3 with suitable examples.	8	CO2, K2																																																							
c.	List the advantages of Decision tree learning.	4	CO2, K2																																																							
Module – 3																																																										
5a.	Define Perceptron. Explain the concept of single perceptron with neat diagram.	10	CO3, K2																																																							
b.	Neural networks reflect the behaviour of the human brain, allowing computer programs to recognize patterns and solve common problems in the fields of AI, machine learning, and deep learning. Given this understanding of Neural Network learning, discuss about the appropriate problems for the same.	10	CO1, K2																																																							
OR																																																										
6a.	Backpropagation is an algorithm that back propagates the errors from output nodes to the input nodes. Present the Backpropagation algorithm for feed forward networks containing two layers of sigmoid units.	10	CO3, K2																																																							
b.	Discuss the perceptron training rule, Gradient Descent and delta rule that solves the learning problem of perceptron.	10	CO1, K2																																																							
Module – 4																																																										
7a.	<p>Consider the 3-bit binary encoding of the 10 decimal digits being classified into two different classes plus (+) and minus (-). Apply Naïve Bayes classifier to classify the given new instance.</p> <p>New Instance: P (A=0, B=1, C=0)</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Record</th> <th>A</th> <th>B</th> <th>C</th> <th>Class</th> </tr> </thead> <tbody> <tr><td>1.</td><td>0</td><td>0</td><td>0</td><td>+</td></tr> <tr><td>2.</td><td>0</td><td>0</td><td>1</td><td>-</td></tr> <tr><td>3.</td><td>0</td><td>1</td><td>1</td><td>-</td></tr> <tr><td>4.</td><td>0</td><td>1</td><td>1</td><td>-</td></tr> <tr><td>5.</td><td>0</td><td>0</td><td>1</td><td>+</td></tr> <tr><td>6.</td><td>1</td><td>0</td><td>1</td><td>+</td></tr> <tr><td>7.</td><td>1</td><td>0</td><td>1</td><td>-</td></tr> <tr><td>8.</td><td>1</td><td>0</td><td>1</td><td>-</td></tr> <tr><td>9.</td><td>1</td><td>1</td><td>1</td><td>+</td></tr> <tr><td>10.</td><td>1</td><td>0</td><td>1</td><td>+</td></tr> </tbody> </table>	Record	A	B	C	Class	1.	0	0	0	+	2.	0	0	1	-	3.	0	1	1	-	4.	0	1	1	-	5.	0	0	1	+	6.	1	0	1	+	7.	1	0	1	-	8.	1	0	1	-	9.	1	1	1	+	10.	1	0	1	+	8	CO4, K1
Record	A	B	C	Class																																																						
1.	0	0	0	+																																																						
2.	0	0	1	-																																																						
3.	0	1	1	-																																																						
4.	0	1	1	-																																																						
5.	0	0	1	+																																																						
6.	1	0	1	+																																																						
7.	1	0	1	-																																																						
8.	1	0	1	-																																																						
9.	1	1	1	+																																																						
10.	1	0	1	+																																																						
b.	A brute force approach is an approach that finds all the possible solutions to find a satisfactory solution to a given problem. Based on this generic idea of brute force, explain the Brute-Force Bayes concept learning with the help of Brute-Force MAP Learning algorithm.	12	CO4, K2																																																							
OR																																																										

8a.	A new burglar alarm is installed in my home. The alarm will beep if there is a burglary at home or if and when an earthquake occurs. Whenever the alarm beeps, two of my friends J and M will call me to inform the same. Depict the same using a Bayesian Belief network with appropriate conditional probability tables.	8	CO4, K1
b.	Bayesian ML is a paradigm for constructing statistical models based on Bayes Theorem. In this context, summarize the features of Bayesian Learning methods.	8	CO4, K2
c.	Define Bayes Theorem and Maximum Posterior Hypothesis.	4	CO4, K2
Module – 5			
9a.	Assume there are two different hypotheses h_1 and h_2 to be tested on two different samples S_1 and S_2 of size n_1 and n_2 respectively. Discuss an approach to find the difference in the error of two hypotheses.	10	CO3, K2
b.	Define Sample Error, True Error, Confidence Intervals, Estimation Bias with suitable examples.	10	CO4, K2
OR			
10a.	Instance-based learning refers to a family of techniques for classification and regression, which produce a class label/prediction based on the similarity of the query to its nearest neighbour(s) in the training set. In this context, write in detail about the K-Nearest Neighbour algorithm and its approach to perform classification. Support your answer with suitable example and illustration.	10	CO3, K2
b.	Discuss the role of confidence intervals for discrete-valued hypothesis in measuring the goodness of true-error estimate when the sample error is provided.	10	CO4, K2

Course Outcomes (COs):

COs	At the end of the course, the student will be able to
CO-1	Design the process of learning models from data.
CO-2	Build suitable Decision tree for a given data set.
CO-3	Apply machine learning algorithms for the given problems.
CO-4	Perform statistical and probabilistic analysis of machine learning techniques.
CO-5	Implement machine learning algorithms for a given use case.
K1- Remembering K2 - Understanding K3 – Applying K4- Analyzing K5 - Evaluating K6 -Creating	

“Success is the progressive realization of a worthy goal.”



BMS INSTITUTE OF TECHNOLOGY AND MANAGEMENT
 (An Autonomous Institution affiliated to VTU, Belagavi)

FIRST INTERNAL ASSESSMENT TEST, JANUARY, 2022 - 23

Course Name	Cloud Computing	Course Code	21MCA302
Branch & Semester	3 RD sem MCA	Date	19-01-2023
Name of the Course Coordinator (s)	Prof. Venkatesh A	Max. Marks	40

Note: Answer THREE full questions from Part A and Part B questions are compulsory.

PART A

Qn. No.	1.	Describe various models for distributed and cloud computing.	Marks	CO
				8 M
Qn. No.	2.	Discuss the following: A Characteristics of Cloud. B Levels of Parallelism.	Marks	CO1 K1
				4 M
Qn. No.	3.	Illustrate various cloud deployment models with example.	Marks	CO2 K2
				4 M
Qn. No.	4.	Why Xen architecture is very much preferred in the industry for virtualization purpose over other architectures? Explain with the help of an architecture diagram.	Marks	CO2 K2
				8 M
Qn. No.	5.	What is the need for cloud computing service models? Explain service models in detail.	Marks	CO3 K1
				8M
Qn. No.	6.	Write short notes on A Service oriented computing. B Utility computing.	Marks	CO3 K1
				4M
Qn. No.	7.	Now a days more and more GPU cores are being embedded in modern computers. Why GPU based computing is getting more prominence in recent times? Compare and contrast GPU architecture with CPU architecture.	Marks	CO1 K3
				8 M
Qn. No.	8.	Consider the case study of Eucalyptus. Many companies are using Eucalyptus as an OS for setting up their private clouds. Analyze how Eucalyptus helps in building private cloud networks and bring out its advantages.	Marks	CO2 K3
				8 M

Course Outcomes (COs)

CO1:	Explore the evolution of cloud computing and enabling technologies
CO2:	Analyze different computing environments
CO3:	Classify various cloud service models and their providers
CO4:	Compare various cloud deployment models
CO5	Demonstrate AWS services to host and manage cloud applications



BMS INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(An Autonomous Institution affiliated to VTU, Belagavi)

SECOND INTERNAL ASSESSMENT TEST, FEBRUARY, 2022 - 23

Course Name	Cloud Computing	Course Code	21MCA302
Branch & Semester	3 RD sem MCA	Date	20-02-2023
Name of the Course Coordinator (s)	Prof. Venkatesh A	Max. Marks	40

Note: Answer THREE full questions from Part A and Part B questions are compulsory.

Qn. No.	PART A	Marks	CO
1	Explain Cloud reference model in detail.	8 M	CO2 K1
OR			
2	What is Operating system level virtualization? Explain how it helps to achieve better performance.	8 M	CO2 K1
3	Cloud as an industry has so many challenges. List out the open challenges of Cloud and suggest how to overcome those challenges.	8 M	CO3 K2
OR			
4	Cloud economy is seeing rapid growth. Discuss about key drivers of Cloud economics and various pricing models available in Cloud computing.	8 M	CO3 K2
5	What is GAE? With the help of the architecture diagram, explain various services provided by GAE.	8M	CO3 K2
OR			
6	What is OpenStack? What makes it so popular in the open source Cloud domain? Explain key advantages of OpenStack.	8M	CO3 K2
PART B			
7	Write the steps to test a user defined function using AWS Lambda. Also write a python function and specify how you pass the input data using JSON.	8 M	CO5 K3
8	Assume the case study of Microsoft Dynamics 365. Compare it with on-premise Microsoft Dynamics CRM and bring out the advantages of hosting a CRM application in Cloud platform. Analyze various services offered by Microsoft Dynamics 365.	8 M	CO3 K3

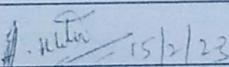
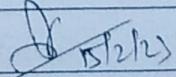
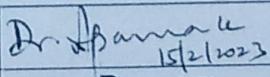
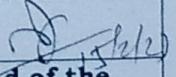
Course Outcomes (COs)

CO1:	Explore the evolution of cloud computing and enabling technologies
CO2:	Analyze different computing environments
CO3:	Classify various cloud service models and their providers
CO4:	Compare various cloud deployment models
CO5	Demonstrate AWS services to host and manage cloud applications

Bloom's Category

Remembering (K1)	Understanding (K2)	Applying (K3)	Analyzing (K4)	Evaluating (K5)	Creating (K6)
------------------	--------------------	---------------	----------------	-----------------	---------------

Signatures of the Question Paper Scrutiny Committee

 15/2/23		 15/2/2023	
Course Coordinator(s)	Scrutiny Committee	Program Coordinator	Head of the Department



BMS INSTITUTE OF TECHNOLOGY AND MANAGEMENT
 (An Autonomous Institution affiliated to VTU, Belagavi)
THIRD INTERNAL ASSESSMENT TEST, MARCH, 2023

Course Name	Cloud Computing	Course Code	21MCA302
Branch & Semester	3 RD sem MCA	Date	20-03-2023
Name of the Course Coordinator (s)	Prof. Venkatesh A	Max. Marks	40

Note: Answer **THREE** full questions from **Part A** and **Part B** questions are compulsory.

PART A

Qn. No.		Marks	CO
1	What is Cloud Firewall? Explain how it helps to overcome Cyber Crimes.	8 M	CO4 K2
2	OR		
3	Elaborate on Cloud security risks.	8 M	CO4 K2
4	Explain any 2 real-time scientific applications of Cloud.	8 M	CO5 K2
5	OR		
6	Explain any one Healthcare application of cloud in real-time.	8 M	CO5 K2
7	What is Autoscaling? How to implement it using AWS?	8M	CO5 K2
8	OR		
6	What are shared images in Cloud? Explain the security threats for shared images.	8M	CO5 K2
	PART B		
7	Write the steps to access S3 bucket using Java.	8 M	CO5 K3
8	Assume the case study of AWS Autoscaling. Analyze the services provided by Autoscaling. Explain how human intervention is avoided to provide better scalability for your application using Autoscaling.	8 M	CO5 K3

Course Outcomes (COs)

CO1:	Explore the evolution of cloud computing and enabling technologies
CO2:	Analyze different computing environments
CO3:	Classify various cloud service models and their providers
CO4:	Compare various cloud deployment models
CO5	Demonstrate AWS services to host and manage cloud applications

Bloom's Category

Remembering (K1)	Understanding (K2)	Applying (K3)	Analyzing (K4)	Evaluating (K5)	Creating (K6)
------------------	--------------------	---------------	----------------	-----------------	---------------

Signatures of the Question Paper Scrutiny Committee

H. M. S. 16/3/23	16/3/23	Dr. A. Parashuram 16/3/2023	16/3/23
Course Coordinator(s)	Module Coordinator	Program Coordinator	Head of the Department



USN

I	B	Y	2	1	M	C	O	9	8
---	---	---	---	---	---	---	---	---	---

21MCA302



BMS INSTITUTE OF TECHNOLOGY AND MANAGEMENT
 (An Autonomous Institute affiliated to Visvesvaraya Technological University, Belagavi)
SEMESTER END EXAMINATION QUESTION PAPER

Third Semester MCA Degree Examination
 Regular / Make-up / Arrears / Supplementary

Time: 3 hrs.

Max. Marks: 100

Note: 1. Answer FIVE full questions, choosing ONE full question from each module.

Q. No	Module – 1	Marks	CO, RBT
1a.	Define Cloud Computing. Elaborate on distributed and cloud environments.	10	CO1, K1
b.	With help of a neat diagram, explain the design issues of cluster architecture	10	CO1, K2
OR			
2a.	Elaborate on Cloud enabling technologies.	10	CO1, K2
b.	Compare and contrast HPC and HTC based systems. Can HPC and HTC run on the same cluster architecture?	10	CO1, K2
Module – 2			
3a.	What is Intrusion Detection System? How to apply it in virtualization of Data Centres? Explain different ways of implementing it.	10	CO2, K1
b.	Explain various Virtualization levels in detail.	10	CO2, K2
OR			
4a.	Illustrate vSphere4 with its architecture. Explain under what circumstances we can use vSphere4. Compare it with Eucalyptus.	10	CO2, K1
b.	Explain working principle of Hardware abstraction layer level virtualization. Illustrate with a real time example.	10	CO2, K2
Module – 3			
5a.	Assuming AWS Web Services, explain any 2 services for each of the following: IaaS, PaaS and SaaS.	8	CO3, K2
b.	For what kind of organizations Private Cloud is very useful? Analyse the limitations of private cloud.	8	CO3, K1
c.	Write short notes on Economics of Cloud.	4	CO3, K2
OR			
6a.	Differentiate between private, public, hybrid and community clouds.	10	CO3, K2

b.	Compare how AWS, Azure and GAE provides virtualized resources in compute, storage, and network clouds.	10	CO3, K2
Module – 4			
7a.	What is OpenStack? Why has it become popular in recent years in the IT industry? Explain its future scope.	10	CO4, K1
b.	Illustrate Azure Architecture with the help of a neat diagram.	10	CO4, K2
OR			
8a.	How cloud can contribute to the Healthcare domain? Explain any one application with example.	10	CO4, K2
b.	Describe various data storage services available in AWS.	10	CO4, K1
Module – 5			
9a.	Write the steps involved to launch a Virtual machine using AWS.	6	CO3, K2
b.	What are shared images? List out the security threats posed by shared images and explain.	8	CO3, K1
c.	When do we use S3 Bucket? Compare S3 bucket with Google Drive	6	CO3, K2
OR			
10a.	Write the procedure(steps) to host a simple webpage on AWS	6	CO5, K2
b.	What is Cloud firewall? Write the procedure to connect clients to cloud instances through firewalls.	8	CO5, K2
c.	Explain how EC2 is helpful for software companies to reduce their expenditure on software purchase and maintenance.	6	CO5, K1

Course Outcomes (COs):

COs	At the end of the course, the student will be able to
CO-1	Explore the evolution of cloud computing and enabling technologies.
CO-2	Analyze different computing environments.
CO-3	Classify various cloud service models and their providers.
CO-4	Compare various cloud deployment models.
CO-5	Deploy applications on real-time cloud platform(s).
K1- Remembering K2 - Understanding K3 – Applying K4- Analyzing K5 - Evaluating K6 -Creating	

“Success is the progressive realization of a worthy goal.”



42 BMS INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(An Autonomous Institute, Affiliated to VTU Belgavi)

Avalahalli, Doddaballapur Main Road, Bengaluru - 560064

FIRST INTERNAL ASSESSMENT TEST, JANUARY 2023

Course Name	ADVANCED PROGRAMMING	Course Code	21MCA3041
Branch & Semester	MCA & III	Date	20-1-2023
Name of the Course Coordinator (s)	Nirupama B K	Max. Marks	40

Note: Answer THREE full questions from Part A and Part B questions are compulsory.

Qn. No.	PART A	Marks	CO's
1.	List out the benefits of .NET framework. Explain them in detail OR	8 Marks	COs:1 K:2
2.	Draw and describe the .NET framework architecture 4.0.	8 Marks	COs:1 K:2
3.	List out all the operators used in C#. Explain any 4 in detail with example. OR	8 Marks	COs:1 K:2
4.	Write a C# program to find the square roots of a given equation. Display all possible roots.	8 Marks	COs:3 K:2
5.	Illustrate with an example the following terms i) Namespace ii) Object iii) Constructor iv) Destructor OR	8 Marks	COs:1 K:2
6.	Define properties. Demonstrate with a program example.	8 Marks	COs:1 K:2
PART B			
7.	Create a class and include related members of a class. Write the code snippet to show the reusability in C# programming.	8 Marks	COs:3 K:4
8.	Assume we are developing library management application. we need to develop different forms, need to develop the database with different necessary tables. List out the namespaces which we use in that application. Write the purpose of the namespace.	8 Marks	COs:4 K:4

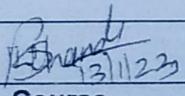
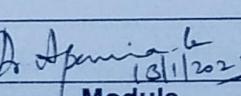
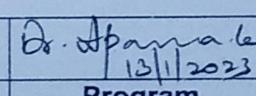
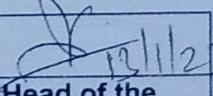
Course Outcomes (COs)

CO1:	Explore C# concepts using .NET framework
CO2:	Apply delegates, events and exception handling with ASP, Win Form and ADO.NET
CO3:	Analyse the usage of .NET Components for a given usecase
CO4:	Design Win and web based .NET applications
CO5:	Build console/web application(s) with Database connectivity

Bloom's Category

Remembering (K1)	Understanding (K2)	Applying (K3)	Analyzing (K4)	Evaluating (K5)	Creating (K6)
---------------------	-----------------------	------------------	-------------------	-----------------	---------------

Signatures of the Question Paper Scrutiny Committee

 Course Coordinator(s) 13/1/23	 Module Coordinator(s) 13/1/2023	 Program Coordinator 13/1/2023	 Head of the Department 13/1/2023
---	---	---	--



BMS INSTITUTE OF TECHNOLOGY AND MANAGEMENT
 (An Autonomous Institute, Affiliated to VTU Belgavi)
 Avalahalli, Doddaballapur Main Road, Bengaluru - 560064
 SECOND INTERNAL ASSESSMENT TEST, FEBRUARY 2023

Course Name	Advanced Programming	Course Code	21MCA3041
Branch & Semester	III MCA	Date	21.2.2023
Name of the Course Coordinator(s)	Nirupama B K	Max. Marks	40

Note: Answer THREE full questions from Part A and Part B questions are compulsory.

Qn. No.	PART A	Marks	CO's
1.	Many times we want to secure our data without inheriting the class and we also extend the method without disturbing the existing. Demonstrate the same with a program example. OR	8 Marks	COs:1K:2
2.	Demonstrate the usage of virtual and override keyword with a program example.	8 Marks	COs:1 K:2
3.	Data abstraction is the process of hiding certain details and showing only essential information to the user. Illustrate this with syntax and explain the characteristics of abstract class and abstract methods. OR	8 Marks	COs:3 K:2
4.	Write the syntax of delegate and explain with a program example	8 Marks	COs:3 K:2
5.	Consider the size of the array is 4. Assume the user tries to display the 5th element of the array in a C# program. Demonstrate the output generated in this context through a C# program. OR	8 Marks	COs:3 K:2
6.	Write the syntax of connection string. Also write the code snippet of the following queries: a) insert b) display.	8 Marks	COs:3 K:2
PART B			
7.	We experience runtime errors though the program is correct logically and syntactically. How do you resolve this problem in OOP? Demonstrate the same with suitable C# program.	8 Marks	COs:2 K:3
8.	Consider our college website. Observe the design of the website. Include the course registration form with the necessary fields such as Name, Age, list of course, Address, gender in the website. Use the below tool box controls in the design of the website. i) Radio Button ii) Combobox iii) Button	8 Marks	COs:4 K:3

Course Outcomes (COs)

CO1:	Explore C# concepts using .NET framework
CO2:	Apply delegates, events and exception handling with ASP, Win Form and ADO.NET
CO3:	Analyse the usage of .NET Components for a given usecase
CO4:	Design Win and web based .NET applications
CO5:	Build console/web application(s) with Database connectivity

Bloom's Category

Remembering (K1) Understanding (K2) Applying (K3) Analyzing (K4) Evaluating (K5) Creating (K6)

Signatures of the Question Paper Scrutiny Committee

Course Coordinator(s)	Module Coordinator(s)	Program Coordinator	Head of the Department



BMS INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(An Autonomous Institution, Affiliated to VTU Belgavi)

Avalahalli, Doddaballapur Main Road, Bengaluru - 560064

THIRD INTERNAL ASSESSMENT TEST, MARCH 2023

Course Name	Advanced Programming	Course Code	21MCA3041
Branch & Semester	III MCA	Date	21.3.2023
Name of the Course Coordinator (s)	Nirupama B K	Max. Marks	40

Note: Answer THREE full questions from Part A and Part B questions are compulsory.

Qn. No.	PART A	Marks	CO's																																								
1.	<p>Design the UI for the registration of the course on a particular date and also write the code snippet for the same. Use the following toolbox controls for the above UI.</p> <ul style="list-style-type: none"> a) Month Calendar Control b) ListBox Control c) Textbox d) Gridview 	8 Marks	COs:3 K:2																																								
	OR																																										
2.	Write how XAML is connected with WPF. And also discuss the syntax and example of XAML properties.	8 Marks	COs:3 K:2																																								
3.	What do you mean by session tracking and use of cookies in session tracking give examples?	8 Marks	COs:3 K:2																																								
	OR																																										
4.	<p>Implement the suitable validation controls for the following UI (User Interface)</p> <table border="1"> <thead> <tr> <th>DonorID</th> <th>DonorName</th> <th>Address</th> <th>ContactNo</th> <th>DOB</th> <th>Gender</th> <th>Weight</th> <th>BloodID</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Amit</td> <td>123 Main St</td> <td>9876543210</td> <td>Saturday, October 29, 2016</td> <td>MALE</td> <td>65</td> <td>AB+</td> </tr> <tr> <td>2</td> <td>Anita</td> <td>Vellore</td> <td>7854321098</td> <td>Saturday, October 29, 2016</td> <td>FEMALE</td> <td>55</td> <td>O-</td> </tr> <tr> <td>3</td> <td>Praveen</td> <td>Hyderabad</td> <td>9876543210</td> <td>Wednesday, Oct 26, 2016</td> <td>FEMALE</td> <td>45</td> <td>AB-</td> </tr> <tr> <td>4</td> <td>Reena</td> <td>Chennai</td> <td>8765432109</td> <td>Wednesday, Oct 26, 2016</td> <td>MALE</td> <td>54</td> <td>O+</td> </tr> </tbody> </table>	DonorID	DonorName	Address	ContactNo	DOB	Gender	Weight	BloodID	1	Amit	123 Main St	9876543210	Saturday, October 29, 2016	MALE	65	AB+	2	Anita	Vellore	7854321098	Saturday, October 29, 2016	FEMALE	55	O-	3	Praveen	Hyderabad	9876543210	Wednesday, Oct 26, 2016	FEMALE	45	AB-	4	Reena	Chennai	8765432109	Wednesday, Oct 26, 2016	MALE	54	O+	8 Marks	COs:3 K:2
DonorID	DonorName	Address	ContactNo	DOB	Gender	Weight	BloodID																																				
1	Amit	123 Main St	9876543210	Saturday, October 29, 2016	MALE	65	AB+																																				
2	Anita	Vellore	7854321098	Saturday, October 29, 2016	FEMALE	55	O-																																				
3	Praveen	Hyderabad	9876543210	Wednesday, Oct 26, 2016	FEMALE	45	AB-																																				
4	Reena	Chennai	8765432109	Wednesday, Oct 26, 2016	MALE	54	O+																																				
5.	Explain the following controls with a code snippet: a) ComboBox Control b) TreeView Control c) ListView	8 Marks	COs:3 K:2																																								
	OR																																										
6.	With a diagram explain the working of WPF 4.0. Also discuss the new features of WPF 4.0.	8 Marks	COs:3 K:2																																								
	PART B																																										
7.	Consider VTU website. How innovatively you can enhance the existing website. Justify your answer.	8 Marks	COs:4 K:3																																								
8.	<p>Consider a banking website. Write the code snippet for master page with the given links: Credit, Debit, zero account. Set the minimum balance to 1000 for a particular day to withdraw or deposite. The bank should have minimum of 100 SB accounts with the minimum above said balance. Perform the following operations.</p> <ol style="list-style-type: none"> Display the list of debited accounts Display the list of credited accounts Display the list of zero balance accounts (For particular day) 	8 Marks	COs:4 K:3																																								



USN 1 B Y 21 M C O 4 8

BMS INSTITUTE OF TECHNOLOGY AND MANAGEMENT
 (An Autonomous Institute affiliated to Visvesvaraya Technological University, Belagavi)
 SEMESTER END EXAMINATION QUESTION PAPER

Third Semester MCA Degree Examination

Regular / Make-up / Arrears / Supplementary

ADVANCED PROGRAMMING

Time: 3 hrs.

Max. Marks: 100

Note: 1. Answer FIVE full questions, choosing ONE full question from each module.

Q. No	Module – 1	Marks	CO, RBT
1a.	With a neat diagram, explain the basic building blocks of .NET platform	10	CO1, K2
b.	Explain in detail each of the following with a suitable example. i. Assembly ii. Multifile assembly iii. Response Files iv. Debuggers	10	CO1, K2
OR			
2a.	i. Differentiate between 'out' & 'ref' method parameter modifiers with one example each. ii. Write any 2 benefits of .NET Assemblies	10	CO1, K2
b.	Explain in detail each of the following with a suitable example. i. Const ii. Readonly iii. Static constructor iv. Common Intermediate Language	10	CO1, K2
Module – 2			
3a.	Write a program to illustrate containment-delegation or has-a inheritance.	10	CO1, K2
b.	Discuss any 4 static members of <i>System.GC</i> type with suitable example.	10	CO1, K2
OR			
4a.	List and explain the object generations of garbage collection.	10	CO1, K2
b.	i. Write the differences between shallow copy & deep copy. ii. Describe the approach to achieve member hiding in C#.	10	CO1, K2
Module – 3			
5a.	i. Differentiate between Finalize & IDisposable Modifiers. ii. Write a program to illustrate virtual & override keywords.	10	CO2, K2

b.	Exemplify partial class. Explain how CLR compiles & executes partial classes.	10	CO2, K2
OR			
6a.	Elaborate the steps involved in building a shared assembly under .NET environment. Mention the approach to install or remove shared assemblies.	10	CO2, K2
b.	Demonstrate arrays of interface types with a C# program.	10	CO2, K2
Module – 4			
7a.	Design a student registration form with the following fields: Name of the Student, Highest Qualification, CGPA, Contact & Email-Id. Write code to add Labels, TextBoxes, Buttons and Groupboxes to interact with the form.	10	CO3, K2
b.	Depict the architecture of WPF and explain each of its components in detail.	10	CO3, K2
OR			
8a.	Design an employee salary slip Windows Form with the following fields: Name of the Employee, Basic_pay, DA, HRA, Deductions, Gross_pay and Net_pay Use Windows controls to calculate Net_pay.	10	CO3, K2
b.	Describe the procedure to connect to a database using C#.NET and frame appropriate insert, delete, update and display queries. (Assume suitable fields).	10	CO3, K2
Module – 5			
9a.	Design a simple web application and write code using ADO.NET to create a complaint web page that displays appropriate message after submission of user input.	10	CO5, K2
b.	Write snippet code to implement the following controls through a simple web page i. GridView Control ii. DropDownList	10	CO5, K2
OR			
10a.	Draw and explain the multi-tier application architecture in ASP.NET.	10	CO5, K2
b.	Discuss about Session Tracking mechanism in ASP.NET with a suitable snippet code.	10	CO5, K2

Course Outcomes (COs):

COs	At the end of the course, the student will be able to
CO-1	Explore C# concepts using .NET framework
CO-2	Apply delegates, events and exception handling with ASP, Win Form and ADO.NET
CO-3	Analyse the usage of .NET Components for a given usecase
CO-4	Design Win and web based .NET applications
CO-5	Build console/web application(s) with Database connectivity
K1- Remembering K2 - Understanding K3 – Applying K4- Analyzing K5 - Evaluating K6 -Creating	

“Success is the progressive realization of a worthy goal.”
