<table>
<tr><td colspan="5">Module 1</td></tr>
<tr><td>1</td><td>a</td><td>Define Machine Learning. Explain its relationship to other fields with diagram</td><td>10</td><td>L1</td></tr>
<tr><td></td><td>b</td><td>Explain different types of machine learning with a diagram</td><td>10</td><td>L2</td></tr>
<tr><td colspan="5">OR</td></tr>
<tr><td>2</td><td>a</td><td>Define data. Explain 6V’s of Big Data</td><td>10</td><td>L1</td></tr>
<tr><td></td><td>b</td><td>Explain data preprocessing with an example</td><td>10</td><td>L2</td></tr>
<tr><td colspan="5">Module 2</td></tr>
<tr><td>3</td><td>a</td><td>Apply and explain principal component analysis algorithm for the given data points and prove that PCA works.
$\binom{2}{6}\binom{1}{7}$</td><td>12</td><td>L3</td></tr>
<tr><td></td><td>b</td><td>Explain continuous and discrete probability distributions</td><td>08</td><td>L2</td></tr>
<tr><td colspan="5">OR</td></tr>
<tr><td>4</td><td>a</td><td>Design a learning system for chess game</td><td>10</td><td>L3</td></tr>
<tr><td></td><td>b</td><td>Explain and apply candidate elimination algorithm for the given dataset
<table>
<tr><th>Example</th><th>Sky</th><th>Temp</th><th>Humidity</th><th>Wind</th><th>Water</th><th>Forecast</th><th>Enjoy Sports</th></tr>
<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>
</table></td><td>10</td><td>L2</td></tr>
<tr><td colspan="5">Module 3</td></tr>
<tr><td>5</td><td>a</td><td>Distinguish between
i. Locally weighted regression and Linear regression
ii. Multiple linear regression and Logistic regression</td><td>10</td><td>L4</td></tr>
<tr><td></td><td>b</td><td>Apply weighted KNN algorithm using the given dataset to classify the test set data (7.6, 60,8) where k=3
<table>
<tr><th>S.No.</th><th>CGPA</th><th>Assessment</th><th>Project Submitted</th><th>Result</th></tr>
<tr><td>1.</td><td>9.2</td><td>85</td><td>8</td><td>Pass</td></tr>
<tr><td>2.</td><td>8</td><td>80</td><td>7</td><td>Pass</td></tr>
<tr><td>3.</td><td>8.5</td><td>81</td><td>8</td><td>Pass</td></tr>
<tr><td>4.</td><td>6</td><td>45</td><td>5</td><td>Fail</td></tr>
<tr><td>5.</td><td>6.5</td><td>50</td><td>4</td><td>Fail</td></tr>
<tr><td>6.</td><td>8.2</td><td>72</td><td>7</td><td>Pass</td></tr>
<tr><td>7.</td><td>5.8</td><td>38</td><td>5</td><td>Fail</td></tr>
<tr><td>8.</td><td>8.9</td><td>91</td><td>9</td><td>Pass</td></tr>
</table></td><td>10</td><td>L3</td></tr>
<tr><td colspan="5">OR</td></tr>
<tr><td>6</td><td>a</td><td>Make use of entropy and information gain to discover the root node for the decision tree for the following dataset using ID3 algorithm.</td><td>14</td><td>L3</td></tr>
</table>

S.No.	CGPA	Interactiveness	Practical Knowledge	Communication Skills	Job Offer
1.	≥9	Yes	Very good	Good	Yes
2.	≥8	No	Good	Moderate	Yes
3.	≥9	No	Average	Poor	No
4.	<8	No	Average	Good	No
5.	≥8	Yes	Good	Moderate	Yes
6.	≥9	Yes	Good	Moderate	Yes
7.	<8	Yes	Good	Poor	No
8.	≥9	No	Very good	Good	Yes
9.	≥8	Yes	Good	Good	Yes
10.	≥8	Yes	Average	Good	Yes

	b	Analyze decision tree learning with its structure, advantages, and disadvantages.	06	L4
		Module 4		
7	a	Define prior probabaility.Explain Bayes theorem, h_{ML} and h_{MAP} with an example	08	L1
	b	Analyze the student performance using Navie Bayes algorithm for continuous attribute. Predict whether student will get job offer or not in the final year.	12	L4

S.No.	CGPA	Interactiveness	Job Offer
1.	9.5	Yes	Yes
2.	8.2	No	Yes
3.	9.3	No	No
4.	7.6	No	No
5.	8.4	Yes	Yes
6.	9.1	Yes	Yes
7.	7.5	Yes	No
8.	9.6	No	Yes
9.	8.6	Yes	Yes
10.	8.3	Yes	Yes

8	a	Analyze different types of artificial neural network with diagram	10	L4
	b	Define activation function. Explain different types of activation function.	10	L1
		Module 5		
9	a	Analyze Grid based approach and mention the steps of CLIQUE	10	L4
	b	Apply k means clustering algorithm for the given data with initial value of objects 2 and 5 considered as initial seeds.	10	L3

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

		OR		
10	a	Determine characteristics, application and challenges of reinforcement learning	10	L3
	b	Analyze components of reinforcement learning with a diagram	10	L4