Sr No.	Question	Marks
	MCQS	**10 Marks**
1.	To determine whether the test statistic of ANOVA is statistically significant, it can be compared to a critical value. What two pieces of information are needed to determine the critical value? **a. sample size, number of groups** b. mean, sample standard deviation c. expected frequency, obtained frequency d. MSTR, MSE	1
2.	Which of the following are types of neural networks? a. Hopfield Network b. Gated Recurrent Unit c. Long / Short Term Memory **d. All of the mentioned**	1
3.	$\Delta w = \eta (t - y) x_i$ In the given image, mathematical formula for _____ is shown. **a. Delta Learning Rule** b. Perceptron Learning Rule c. Hebbian learning rule d. None of the above	1
4.	Which of the rule assumes the following statement? "If two neighbor neurons activated and deactivated at the same time. Then the weight connecting these neurons should increase. For neurons operating in the opposite phase, the weight between them should decrease. If there is no signal correlation, the weight should not change." a. Delta Learning Rule b. Perceptron Learning Rule **c. Hebbian learning rule** d. None of the above	1
5.	Which of the following statements are true about back propagation algorithm? Statement 1: Backpropagation can be quite sensitive to noisy data. Statement 2: Need to use the matrix-based approach for backpropagation instead of mini-batch. Statement 3: The actual performance of backpropagation on a specific problem does not depend on the input data.	1

	a. Statement 1 & statement 3 are correct. **b. Statement 1 & statement 2 are correct.** c. Statement 2 & statement 3 are correct. d. All the statements are correct.	
6.	The Bayesian Belief Network can be used for _____. a. decision making under uncertainty b. Anomaly detection c. Diagnostics d. Time series prediction **e. All of the mentioned** f. None of the mentioned	1
7.	Which of the following statements are true about EM algorithm? Statement 1: It has slow convergence. Statement 2: It makes convergence to the local optima only. Statement 3: It can be used for discovering the values of latent variables. Statement 4: Solutions to the M-steps often exist in the open form. **a. Statement 1, statement 2 and statement 3 are correct.** b. Statement 1, statement 3 and statement 4 are correct. c. Statement 1, statement 2 and statement 4 are correct. d. All the statements are correct.	1
8.	State true or false: The standard Q-learning algorithm (using a Q table) applies only to discrete action and state spaces. **a. True** b. False	1
9.	Which of the following is/are application/applications of Restricted Boltzmann machine? a. Dimensionality reduction b. Recommender systems c. Topic modelling. **d. All of the above.**	1
10.	What is true about CNN? a. It classifies the images with different positions. b. The computational cost is high. c. CNN is not invariant to rotation and scale. **d. All of the above.**	1

<table>
<tr><td colspan="2">Descriptive Questions</td><td>20 Marks</td></tr>
<tr><td>11.</td><td>
<table>
<tr><th>WEIGHT</th><th>FOOD INTAKE</th><th>Exercising</th><th>DIABETIC</th></tr>
<tr><td>< 80</td><td>Low</td><td>Never</td><td>No</td></tr>
<tr><td>>= 80</td><td>Medium</td><td>Regularly</td><td>No</td></tr>
<tr><td>< 80</td><td>High</td><td>Never</td><td>Yes</td></tr>
<tr><td>>= 80</td><td>High</td><td>Occasionally</td><td>No</td></tr>
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<tr><td>< 80</td><td>Low</td><td>Regularly</td><td>No</td></tr>
</table>
For above data, where “Diabetic” is the target variable, using Gini Index if a decision tree is made. Which attribute has the highest Gini Index?
</td><td>5</td></tr>
<tr><td>12.</td><td>Find the hyperplane for the linear SVM.
Positively labeled data points {(3,1), (3, -1), (6, 1), (6, -1)}
Negatively labeled data points {(1, 0), (0, 1), (0, -1), (-1, 0)}</td><td>5</td></tr>
<tr><td>13.</td><td>Consider the given dataset, apply the Naïve-Bayes’ Algorithm and predict that if the fruit has the following properties then which type of fruit it is?

Fruit = {Yellow, Sweet, Long}

Frequency Table
<table>
<tr><th>Fruit</th><th>Yellow</th><th>Sweet</th><th>Long</th><th>Total</th></tr>
<tr><td>Mango</td><td>350</td><td>450</td><td>0</td><td>650</td></tr>
<tr><td>Banana</td><td>400</td><td>300</td><td>350</td><td>400</td></tr>
<tr><td>Other</td><td>50</td><td>100</td><td>50</td><td>150</td></tr>
<tr><td>Total</td><td>800</td><td>850</td><td>400</td><td>1200</td></tr>
</table>
</td><td>5</td></tr>
<tr><td>14.</td><td>Write in brief about Deep Belief Network.</td><td>5</td></tr>
<tr><td>15.</td><td>Write in brief about EM algorithm.</td><td>5</td></tr>
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