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| Enrolment No: | |

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES	
End Semester Examination, May 2020	
Course: Introduction to Artificial Intelligence	
	Semester: II
Course Code: CSAI1002	Time: 2hrs
Programme: B.Tech AIML	Max. Marks: 60
Instructions: All questions are compulsory	

UPES

	Sudhanshu Srivastava ▼

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H   Tests, Surveys and Pools   Tests   **Test Canvas : End Term**   Edit Mode is: ● ON

Test Canvas: End Term

The Test Canvas lets you add, edit and reorder questions, as well as review a test. ___More Help___

Question Settings

You can edit, delete or change the point values of test questions on this page. If necessary, test attempts will be regraded after you submit your changes.

Description	Dear Students,
	ALL AIML Batches,
	This is your **Introduction to Artificial Intelligence End Term Examination** scheduled for tomorrow i.e **10th July 2020** from **10 AM to 12:30 PM**
	All the best!!
Instructions	Total Questions = 60
	Max. Time = 150 minutes
	Max. Marks = 60
	There is NO Negative Marking
	Backtracking is NOT allowed
Total Questions	60
Total Points	60
Number of Attempts	149

Select: All None | Select by Type: - Question Type - ⌄

Delete and Regrade | Points [   ]   Update and Regrade | Hide Question Details

Multiple Choice: Consider the below statements regardi...   Points: **1**

Question   Consider the below statements regarding Artificial Intelligence:

(a) the study of mental faculties through computational models
(b) an attempt to make computers do tasks for which humans are considered intelligent
(c) intelligence but that is not genuine
(d) an attempt to find good solutions for computationally hard problems

Correct statements are?

Answer   a,b only

     c only

dc only

✅ aabbdononly

Multiple Choice: What kind of Graph is used to ree... Points: 11

Question	What kind of Graph is used to represent semantic network?
Answer	Undirected graph
	Directed Acyclic graph (DAG)
	✅ Directed graph
	Directed complete graph

Multiple Choice: Points: 11

Question	A company is having 9 workers. In how many different ways we can create team of 5 workers?
Answer	132
	✅ 126
	84
	72

Multiple Choice: Identify the incorrect statements: (... Points: 11

Question	Identify the incorrect statements: (a) Logistic Regression and SVM both have a hypercurve as a decision surface (b) Logistic Regression is a linear model (c) Logistic Regression can be used for regression problems (d) Logistic regression can be designed using a neural network
Answer	b,d
	a,b,d
	c only
	✅ a,c

Multiple Choice: Identify the incorrect statements reg... Points: 11

Question	Identify the incorrect statements regarding Bayesian Networks:
	(a) Bayesian uses every available information to find the probability. This indicates that apart from data, the method uses prior information as well.
	(b) When there is a lack of parameters and facts, Bayesian quantify uncertainties using available evidence.
	(c) Bayesian machine learning is useful when there are fewer data available.
	(d) Bayesian network uses joint probability distribution

Answer	
	a,b,d
	c only
	b,c
	✅ none of the above

Multiple Choice: Points: 11

Question	Reinforcement learning is a _____ method, in which a learning agent gets a reward for each right action and gets a penalty for each wrong action. The agent learns automatically with these feedbacks and improves its performance.

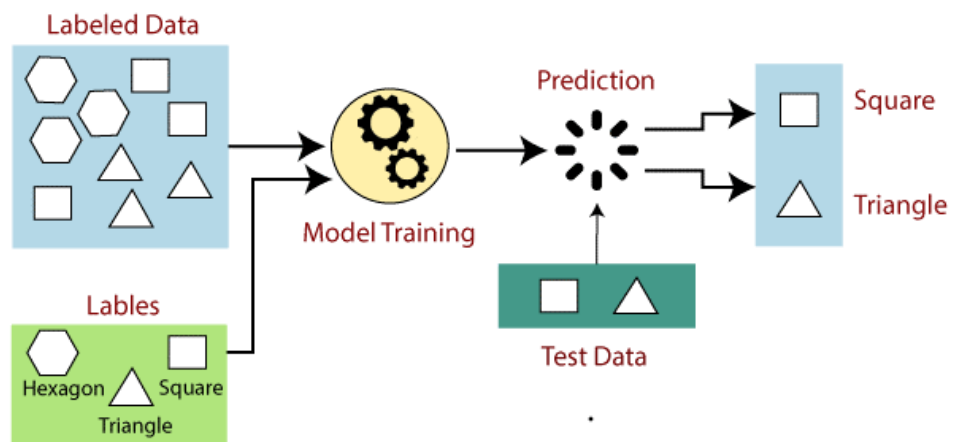| Answer	
	✅ feedback based learning
	supervised learning
	unsupervised learning
	either a or b

Multiple Choice: What does the diagram depict? Select ...   Points: 11

Question	What does the diagram depict? Select the most appropriate answer .

Answer	
	✅ supervised learning
	unsupervised learning
	reinforcement learning

either a or c

☐ **Multiple Choice : "We know that our data is corree...**   Points: **11**

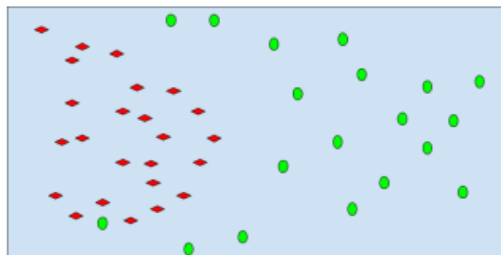| Question	"We know that our data is correlated, but the relationship doesn't look linear".
	Based on the above statement consider the below options:
	Option A: It is very difficult to fit a linear regression line in the above graph with a low value of error.
	Option B: we can try to use the polynomial regression to fit a polynomial line so that we can achieve a minimum error or minimum cost function.
Answer	✅ Both option A and B are correct
	Both option A and B are incorrect
	Option A is wrong, Option B is right
	Option A is right, Option B is wrong

☐ **Multiple Choice : Suppose you try to separate these two classes. What could be the complexity of your decision surface : Suppose you try to separate these two...**   Points: **11**

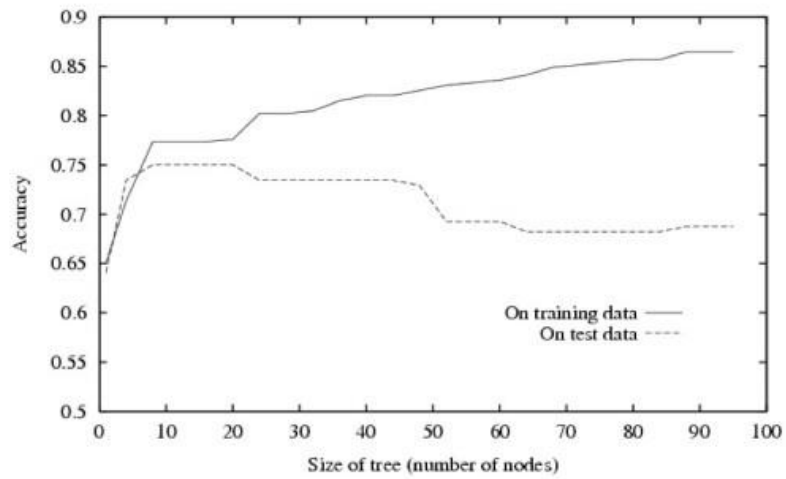| Question	Suppose you try to separate these two classes. What could be the complexity of your decision surface?
Answer	linear
	cubic
	exponential
	✅ None of the above

☐ **Multiple Choice : Overfitting is happening when number...**   Points: **11**

Question

Overfitting is happening when number of node is?

Answer	
	5
✅	20
	30
	Model is underfitting

☐ Multiple Choice: Consider the below figures: &&... **Points: 11**

Question	Consider the below figures:

Fig a   **Fig b**

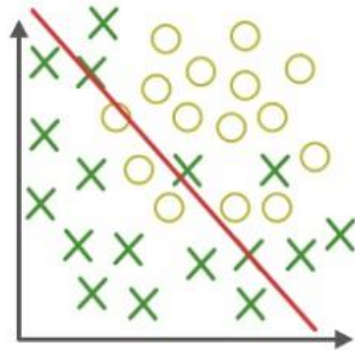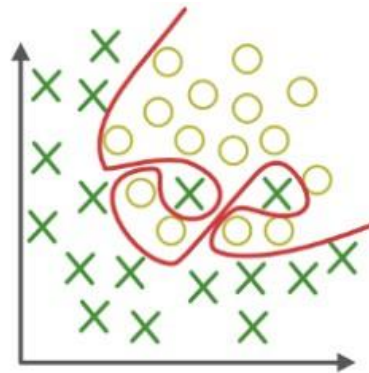| Answer	
	Fig a is overfitting and Fig b is underfitting
✅	Fig a is underfitting and Fig b is overfitting
	Fig a is appropriate fitting or generalized model and Fig b is overfitting
	none

☐ Multiple Choice: **Points: 11**

Question

Identify the correct statement.

(a) The primary objective of the selection operator is to emphasize the good solutions and eliminate the bad solutions in a population while keeping the population size constant.
(b) A fitness function value quantifies the optimality of a solution. The value is used to rank a particular solution against all the other solutions
(c) The mutation operator is used to create new solutions from the existing solutions available in the mating pool after applying selection operator.
(d) Crossover is the occasional introduction of new features in to the solution strings of the population pool to maintain diversity in the population.
(e) The mutation probability is generally kept low for steady convergence.

Answer	
	a,b,c,d
	✅ a,b,e
	d,e
	b,d

Multiple Choice : Identify the incorrect statement for....   Points: 11

Question	Identify the incorrect statement for GD(Gradient Descent) and SGD(Stochastic Gradient Descent):
	1. In GD and SGD, you update a set of parameters in an iterative manner to minimize the error function.
	2. In SGD, you have to run through all the samples in your training set for a single update of a parameter in each iteration.
	3. In GD, you either use the entire data or a subset of training data to update a parameter in each iteration.

Answer	
	only 1
	1 and 2
	3 only
	✅ 2 and 3

Multiple Choice : _____ is a type of machine....   Points: 11

Question	_____ is a type of machine learning method in which we provide sample labeled data to the machine learning system in order to train it, and on that basis, it predicts the output.

Answer	
	UnSupervised Learning
	✅ Supervised Learning
	Artificial Intelligence
	None of the above

Multiple Choice: Below is an example of?   Points: **11**

Question	Below is an example of?

Answer	
	✅ Acyclic Neural network
	Feed forward network
	Fully connected Network
	Layered Network

Multiple Choice: Points: **11**

Question	Two parent chromosomes in Order GA encoding scheme is given as follows:

1	2	3	4	5	6	7	8	9	10

10	9	8	7	6	5	4	3	2	1

A $K - point$ is selected at 4th location according to single point crossover technique. Which of the following off-spring is not possible?

(a)

1	2	3	4	10	9	8	7	6	5

(b)

7	8	9	10	6	5	4	3	2	1

(c)

10	9	8	7	1	2	3	4	5	6

Answer	
	a,b
	c only
	b,d
	✅ all are possible

Multiple Choice: Which among the following is/are some...   Points: **11**

Question	

Which among the following is/are some of the assumptions made by the k-means algorithm (assuming Euclidean distance measure)?

(a) Clusters are spherical in shape
(b) Clusters are of similar sizes
(c) Data points in one cluster are well separated from data points of other clusters
(d) There is no wide variation in density among the data points

Answer	
	b,c
	✅ a,b
	a,b,c
	d only

Multiple Choice:

Points: **11**

Question	Which of the following is/are true regarding an SVM?
	(a) For two dimensional data points, the separating hyperplane learnt by a linear SVM will be a straight line.
	(b) In theory, a Gaussian kernel SVM can model any complex separating hyperplane.
	(c) For every kernel function used in a SVM, one can obtain a equivalent closed form basis expansion.
	(d) Overfitting in an SVM is a function of number of support vectors.

Answer	
	✅ a,b,d
	d only
	a,b
	c,d

Multiple Choice: In building a linear regression model...

Points: **11**

Question	In building a linear regression model for a particular data set, you observe the coefficient of one of the features having a relatively high negative value. This suggests that?

Answer	
	This feature has a strong effect on the model (should be retained)
	This feature does not have a strong effect on the model (should be ignored)
	✅ It is not possible to comment on the importance of this feature without additional information
	None of the above

Multiple Choice: Consider the below statements (a) "An...

Points: **11**

Question	Consider the below statements:
	(a) Any mathematical function can be designed using a neural network algorithm
	(b) Neural networks are universal approximators

Answer

Statement a is right and Statement b is wrong

Statement a is wrong and Statement b is right

✅ Statement a is right and Statement b is the correct explanation for Statement a

Statement a is right but Statement b is the not the correct explanation for Statement a

---

☐ **Multiple Choice: Which of the pairs of random variable...**   Points: **11**

Question	Which of the pairs of random variables are independent?

Answer

A,B

C,D

E,D

✅ None

☐ **Multiple Choice: The "Turing Test" is … /**...**   Points: **11**

Question

The "Turing Test" is …

Answer

a test devised by Alan Turing to determine whether a secret code is breakable

a test to determine whether a Turing Machine will halt

✅ a test of whether a machine is intelligent prescribed by Turing

none of the above

☐ **Multiple Choice: What is Machine learning? a) The aut...**   Points: **11**

Question

What is Machine learning?

a) The autonomous acquisition of knowledge through the use of computer programs
b) The autonomous acquisition of knowledge through the use of manual programs
c) The selective acquisition of knowledge through the use of computer programs
d) The selective acquisition of knowledge through the use of manual programs

Answer	
	a,c
✅	a only
	c only
	b,d

Multiple Choice: A) Knowledge base (KB) is consists of...　　　　　　　　**Points: 11**

Question	A) Knowledge base (KB) is consists of set of statements. B) Inference is deriving a new sentence from the KB. Choose the correct option.
Answer	✅ A is true, B is true
	A is true, B is false
	A is false, B is false
	A is false, B is true

Multiple Choice: Which of the following techniques can...　　　　　　　　**Points: 11**

Question	Which of the following techniques can be used for the purpose of keyword normalization, the process of converting a keyword into its base form? 1. Lemmatization 2. Levenshtein 3. Stemming 4. Soundex
Answer	1,2
	✅ 1,3
	2,4
	1,2,3,4

Multiple Choice: What is the right order for a text cl...　　　　　　　　**Points: 11**

Question	What is the right order for a text classification model components 1. Text cleaning 2. Text annotation 3. Gradient descent 4. Model tuning 5. Text to predictors
Answer	12345
	13425
	✅ 12534
	13452

Multiple Choice: What is back propagation?/*/docu...   Points: **11**

Question	What is back propagation?
Answer	It is another name given to the curvy function in the perceptron
	It is the transmission of error back through the network to adjust the inputs
	✅ It is the transmission of error back through the network to allow weights to be adjusted so that the network can learn
	None of the mentioned

Multiple Choice: Semantic Network represents...   Points: **11**

Question	Semantic Network represents _____
Answer	Syntactic relation between concepts
	✅ Semantic relations between concepts (s)
	All of the mentioned
	None of the mentioned

Multiple Choice: Graph used to represent semantic netw...   Points: **11**

Question   Graph used to represent semantic network is _____

Answer   Undirected graph

_____

✅ Directed graph (s)

_____

Directed Acyclic graph (DAG)

_____

Directed complete graph

Multiple Choice: Translate the following statement ...   Points: **11**

Question   Translate the following statement into FOL. "For every a, if a is a PhD student, then a has a master degree"

Answer   ✅

∀ a PhD(a) -> Master(a) (s)

_____

∃ a PhD(a) -> Master(a)

A is true, B is true

_____

A is false, B is false

Multiple Choice: Below are the 8 actual values of targ...   Points: **11**

Question   **Below are the 8 actual values of target variable in the train file.**

[0,0,0,1,1,1,1,1]

What is the entropy of the target variable?

Answer   5/8 log(5/8) + 3/8 log(3/8)

_____

✅ -(5/8 log(5/8) + 3/8 log(3/8))

_____

3/8 log(5/8) + 5/8 log(3/8)

_____

5/8 log(3/8) – 3/8 log(5/8)

Multiple Choice: The field that investigates the mecha...   Points: **11**

Question   The field that investigates the mechanics of human intelligence is:

Answer   ✅

cognitive science (s)

history

psychology

. sociology

☐ **Multiple Choice: A feature F1 can take certain value: ...**

Points: 1

Question	A feature F1 can take certain value: A, B, C, D, E, & F and represents grade of students from a college.
	Which of the following statement is true in following case?

Answer	Feature F1 is an example of nominal variable.
✓	Feature F1 is an example of ordinal variable.
	It doesn't belong to any of the above category.
	It doesn't belong to any of the above category.

☐ **Multiple Choice: What is Artificial intelligence...**

Points: 1

Question	What is Artificial intelligence?
Answer	Putting your intelligence into Computer
✓	Making a Machine intelligent
	Programming with your own intelligence
	Playing a Game

☐ **Multiple Choice: Consider the following figure for ans...**

Points: 1

Question	

Consider the following figure for answering the next few questions. In the figure, X1 and X2 are the two features and the data point is represented by dots (-1 is negative class and +1 is a positive class). And you first split the data based on feature X1(say splitting point is x11) which is shown in the figure using vertical line. Every value less than x11 will be predicted as positive class and greater than x will be predicted as negative class.
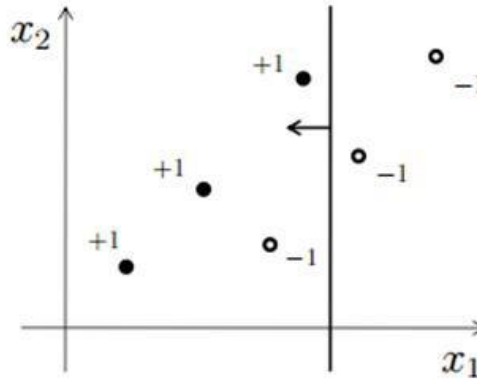
How many data points are misclassified in above image?

Answer	
✅	1
	2
	3
	4

☐ **Multiple Choice: Suppose a life ...**   Points: **1**

Question

Suppose a life insurance company sells a ₹240,000 one year term life insurance policy to a 25-year old female for ₹210. The probability that the female survives the year is .999592. Find the expected value of this policy for the insurance company.

Answer

	₹ 131
	₹ 140
✅	₹ 112
	₹ 125

☐ **Multiple Choice: Probabilty dens...**   Points: **1**

Question

Probabilty density functions are related to ------------------ variables

Answer

Discrete

✅

Continious
Random

Random

Continous

☐ **Multiple Choice: Significance of 'inference' in expert...**   Points: **1**

Question	Significance of 'inference' in expert systems
Answer	
	Support
	✅ Extract
	Analyze
	Evaluate

☐ **Multiple Choice: Which intellige...**   Points: **1**

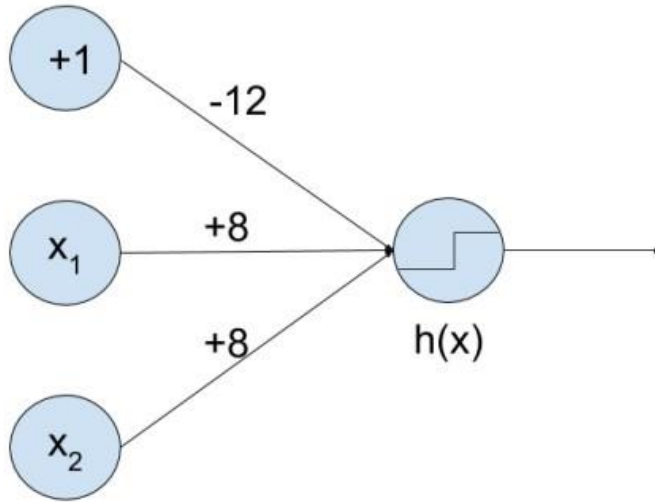| Question	
	Which intelligence is best
Answer	✅ Artificial
	Cognitive
	Evolutionary
	Ambient

☐ **Multiple Choice: You are given the following neural ne...**   Points: **1**

Question	You are given the following neural networks which take two binary valued inputs x1, x2 ∈ {0, 1} and the activation function is the threshold function(h(x) = 1 if x > 0; 0 otherwise). Which of the following logical functions does it compute?

Answer	OR
	✅ AND
	NAND
	None of the above.

☐ **Multiple Choice: Which of the following statements is/...**   Points: **1**

| Question | Which of the following statements is/are true about Neural Networks?

(a) Neural Networks can model arbitrarily complex decision boundaries.
(b) Neural Networks can be used to emulate a Gaussian kernel SVM
(c) Training of a neural network is very sensitive to the initial weights.
(d) Ideal initialization for weights would be setting all of them to zeros |
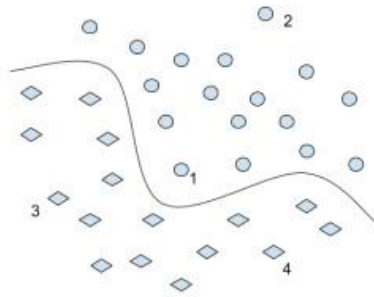|---|---|
Answer	A,B
	B,C
	✅ A,B,C
	A,C

☐ **Multiple Choice: For a two-class classification proble...**   Points: **1**

Question	

For a two-class classification problem, we use an SVM classifier and obtain the following separating hyperplane. We have marked 4 instances of the training data. Identify the point which will have the most impact on the shape of the boundary on it's removal.

Answer	
✅	1
	2
	3
	4

☐ Multiple Choice: In building a linear regression model...

Points: **1**

Question	In building a linear regression model for a particular data set, you observe the coefficient of one of the features having a relatively high negative value. This suggests that
Answer	This feature has a strong effect on the model (should be retained)
	This feature does not have a strong effect on the model (should be ignored)
✅	It is not possible to comment on the importance of this feature without additional information
	None of the above

☐ Multiple Choice: What are Semantic Networks? // do...**

Points: **1**

| Question	What are Semantic Networks?
Answer ✅	A way of representing knowledge
	Data Structure
	Data Type
	None

☐ Multiple Choice: Here is a popular toy graphical model...

Points: **1**

Question

Here is a popular toy graphical model. It models the grades obtained by a student in a course and it's implications. Difficulty represents the difficulty of the course and intelligence is an indicator of how intelligent the student is, SAT represents the SAT scores of the student and Letter presents the event of the student receiving a letter of recommendation from the faculty teaching the course.
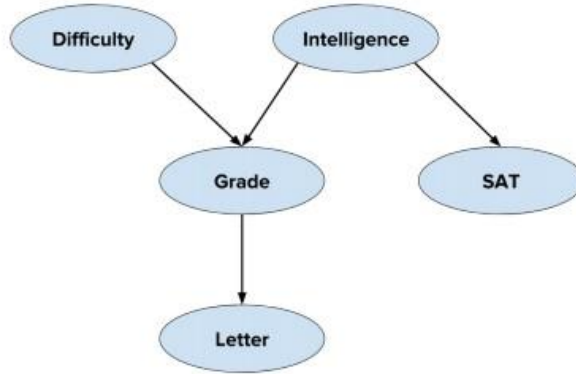
Given this graphical model, which of the following statements are true?

(a) Given the grade, difficulty and letter are indpendent variables.
(b) Given grade, difficulty and intelligence are independent
(c) Without knowing any information, Difficulty and Intelligence are independent.
(d) Given the intelligence, SAT and grades are independent.

Answer	
	A,C
	B,D
✅	A,C,D
	A,B,C

☐ **Multiple Choice: Which of the following is an applicat...**   Points: **1**

Question	Which of the following is an application of AI?
Answer	Gaming
	Expert Systems
	Vision Systems
✅	All of the above

☐ **Multiple Choice: Neural Networks are complex_____...**   Points: **1**

Question	Neural Networks are complex _ with many parameters.
Answer	✅ Linear Functions
	Nonlinear Functions
	Discrete Functions

Exponential Functions

☐ **Multiple Choice: What are the input and output of an N...**

Points: **1**

Question	What are the input and output of an NLP system?
Answer	Speech and noise
	✅ Speech and Written Text
	Noise and Written Text
	Noise and value

☐ **Multiple Choice: Which of the following is not the typ...**

Points: **1**

Question	Which of the following is not the type of AI?
Answer	Reactive machines
	✅ Unlimited memory
	Theory of mind
	Self-awareness

☐ **Multiple Choice: In ensemble learning, you aggregate t...**

Points: **1**

Question	In ensemble learning, you aggregate the predictions for weak learners, so that an ensemble of these models will give a better prediction than prediction of individual models.
	Which of the following statements are not true for weak learners used in ensemble model?
	1. **They don't usually overfit.**
	2. **They have high bias, so they cannot solve complex learning problems**
	3. **They usually overfit.**
Answer	1 and 2
	✅ 3 only
	2 and 3
	None of the above

☐ **Multiple Choice: Let's say, you are using activa...**

Points: **1**

Question	Let's say, you are using activation function X in hidden layers of neural network. At a particular neuron for any given input, you get the output as "-0.0001". Which of the following activation function could X represent?
Answer	ReLU
	✅ tanh
	SIGMOID
	can't say

☐ **Multiple Choice: For which of the following hype...**

Points: **1**

Question	For which of the following hyperparameters, higher value is better for decision tree algorithm? 1. **Number of samples used for split** 2. **Depth of tree** 3. **Samples for leaf**
Answer	1,2
	3 only
	2 only
	✅ can't say

☐ **Multiple Choice: Which of the following is a good test...**

Points: **1**

Question	Which of the following is a good test dataset characteristic?
Answer	Large enough to yield meaningful results
	Is representative of the dataset as a whole
	✅ Both A and B
	None of the above

☐ **Multiple Choice: Identify the correct statements: a) ...**

Points: **1**

Question	Identify the correct statements:
	a) If small changes in the genotypes of individuals are expressed easily, especially in small populations, we speak of genetic drift
	b) Mitosis is copying the same genetic information to new offspring: there is no exchange of information
	c) Individual - Blueprint for an individual
	d) Chromosome - Any possible solution

Answer	a,b,d
	✅ **a,b**
	c,d
	none

☐ **Multiple Choice: ntify the incorrect stae: Identify the correct statements: a) ...**   Points: [1]

Question	Identify the correct statements:
	a) In roulette wheel selection, individuals are given a probability of being selected that is directly proportionate to their fitness.
	b) There is a chance that the chromosomes of the two parents are randomly recombined (crossover) to form offspring
	c) Mutation restores lost information to the population Generating new offspring from single parent
Answer	a,c
	a,b
	c only
	✅ **a,b,c**

☐ **Multiple Choice: "Pheromone trails" is related to? /*...**   Points: [1]

Question	"Pheromone trails" is related to?
Answer	Travelling Salesman Problem
	✅ **Ant colony optimisation**
	Natural language processing
	Neural networks

☐ **Multiple Choice: Some application of Ant colony optimi...**   Points: [1]

Question	Some application of Ant colony optimisation are:
Answer	Set partition problem: Deciding whether a given multiset of positive integers can be partitioned into two subsets A and B such that the sum of the numbers in A equals the sum of the numbers in B.
	Data Mining: The computational process of discovering patterns in large data sets.
	✅ **Both a and b**
	none

☐ **Multiple Choice: Identify the incorrect statements: a...**   Points: **1**

Question	Identify the incorrect statements:
	a) Linear Logistic Regression is always better than Linear SVM b) SVM may have a decision surface other than a hyperplane if used kernel function c) Time complexity of K-NN and K-Means over the same dataset will always be same d) A single node decision tree or which is known as a "Stump Tree" will always underfit e) If there is overfitting in your dataset better to reduce your dataset by half
Answer	a,c,d,e
	a,b,e
	c,d
	✅ a,b,c,e

☐ **Multiple Choice: Identify the incorrect statements: a...**   Points: **1**

Question	Identify the incorrect statements:
	a) We need a very high processing power to run deep learning algorithms along with a huge dataset b) A single perceptron is nothing but a linear classifier c) As we go on increasing the length of a decision tree, chances of overfitting incereases d) Support vecors in a SVM are the datapoints lying on the margins
Answer	a only
	a,c
	b only
	✅ none

☐ **Multiple Choice: Ways to perform...**   Points: **1**

Question	
	Ways to perform resolution
Answer	Algorithm
	Heuristics
	Uniformity
	✅ All the above

Select: <u>All</u> <u>None</u> | Select by Type: - Question Type - ⌄

Delete and Regrade   Points [ ]   Update and Regrade   Hide Question Details

← **OK**