BRAINWARE UNIVERSITY

Term End Examination 2023
Programme – M.Tech.-RA-2022
Course Name – Machine Learning in Robotics
Course Code - PEC-MIRA201A
(Semester II)

Full Marks : 60 **Time : 2:30 Hours**

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

Group-A

(Multiple Choice Type Question) 1 x 15=15

1. *Choose the correct alternative from the following :*

(i) Identify which of the factors affect the performance of the learner system does not include?

a) Good data structures
b) Representation scheme used
c) Training scenario
d) Types of feedback

(ii) Recognize what a machine learning approach involves

a) Choosing the type of training experience
b) Choosing the target function to be learned
c) Choosing a representation for the target function
d) All of these

(iii) Select the applications of NN (Neural Network)

a) Risk Management
b) Data validation
c) Sales forecasting
d) All of these

(iv) Identify the network that involves backward links from output to the input and hidden layers is known as

a) Recurrent neural network
b) Self organizing map
c) Perceptrons
d) SVM

(v) Select which of the following ensemble model helps in reducing variance.

a) Boosting
b) Bagging
c) Stacking
d) Voting

(vi) Predict which one is the sampling error in statistics.

a) Difference between population and parameter
b) Difference between population and sample
c) Difference between sample and mean
d) Difference between sample and parameter

(vii) Identify what is true about an ensembled classifier. 1. Classifiers that are more sure can vote with more conviction 2. Classifiers can be more sure about a particular part of the space 3. Most of the times, it performs better than a single classifier

a) 1 and 2 b) 1 and 3
c) 2 and 3 d) All of these

(viii) Choose which Reinforcement is defined as when an event, occurs due to a particular behavior.

a) Negative b) Positive
c) Neutral d) None of these

(ix) Predict Reinforcement learning is one of _____ basic machine learning paradigms

a) 5 b) 4
c) 2 d) 3

(x) Examine the clustering method which takes care of variance in data

a) Decision tree b) Gaussian mixture model
c) K means d) All of these

(xi) Analyze which of the followings are most widely used metrics and tools to assess a classification model.

a) Confusion matrix b) Cost-sensitive accuracy
c) Area under the ROC curve d) All of these

(xii) Estimate the data used to optimize the parameter settings of a supervised learner model.

a) Test b) Training
c) Validation d) None of these

(xiii) The most widely used metrics and tools to assess a classification model are:

a) Confusion matrix b) Cost-sensitive accuracy
c) Area under the ROC curve d) All of the above

(xiv) Decide which of the following clustering algorithm merges and splits nodes to help modify nonoptimal partitions

a) K-Means clustering b) Conceptual clustering
c) Agglomerative clustering d) All of these

(xv) Decide the general tasks that are performed with backpropagation algorithm

a) Pattern mapping b) Prediction
c) Function approximation d) All of these

Group-B

(Short Answer Type Questions) 3 x 5=15

2. What is bias and variance? (3)

3. Explain Unsupervised Learning. (3)
4. Determine PCA and its use. (3)
5. Explain the difference between L1 and L2 regularization. (3)
6. Differentiate in between supervised and unsupervised machine learning? (3)

OR

Differentiate between clustering and classification. (3)

Group-C

(Long Answer Type Questions) 5 x 6=30

7. Discover how Ensemble Models work better when the Models have Low Correlation. (5)
8. Illustrate the three stages of building a model in Machine Learning. (5)

9. Justify the performance parameter that can be calculated using confusion matrix. (5)

10. Explain reinforcement learning in detail along with the various elements involved in forming the concept. Also define what is meant by partially observed state. (5)

11. Explain how reinforcement learning problem distinguishes from other function approximation. (5)

12. Define Machine learning? (5)

OR

Describe different types of Machine Learning. (5)

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