VISHWAKARMA UNIVERSITY
Maximising Human Potential

Question Paper

Faculty: Science and Technology **Department:Computer Engineering** **Semester: 7**

Course Code: BTECHCS701 **Course Name: Machine Learning**

Time: 2.15 hrs. **Max. Marks: 50**

Instructions to Candidates:

1. All questions are compulsory.
2. Figures to right indicate full marks.
3. Assume suitable data if necessary.

Section A: Multiple Choice Questions **10 marks (1 mark each)**

Q.1. Which of the following is the best dataset characteristic?
a. Large enough to yield meaningful results
b. Is representative of the dataset as a whole
c. Both A and B
d. None of the above

Q.2. Which of the following statement is true regarding Maxnet?
a. There is no need for training the network, since the weights are fixed
b. The n-nodes of Maxnet are fully connected
c. Both A and B
d. Only C

Q.3 In general, to have a well-defined learning problem, we must identify which of the following
a. The class of tasks
b. The measure of performance to be improved
c. The source of experience
d. All of the above

Q.4 High entropy means that the partitions in classification are
a. Pure
b. Not pure
c. Useful
d. Useless

Q.5 What type machine learning algorithm is suitable for predicting the depended variable with two different values?
a. Linear regression
b. Multiple Linear Regression
c. Logistic Regression
d. Polynomial Regression

Q.6 The most widely used metrics and tools to assess a classification model are :
a. Confusion matrix
b. Cost-sensitive acuuracy
c. Both a and b
d. None of the above

Q.7 Which of the following is a disadvantage of decision tree?
a. Factor Analysis
b. Decision trees are prone to be overfit
c. The decision tree is robust to outlier
d. None of the above

Q.8 How can you prevent a clustering algorithm from getting stuck in bad local optima?
a. Set the same seed value for each run
b. Use multiple random initializations
c. Both And B
d. Only A

Q.9 Which of the following are real world applications of the SVM?
a) Text and Hypertext Categorization
b) Image Classification
c) Clustering of News Articles
d) All of the above

Q.10. A perceptron adds up all the weighted inputs it receives, and if it exceeds a certain value, it outputs a 1, otherwise it just outputs a 0.
a) True
b) False
c) Sometimes – it can also output intermediate values as well
d) Can't say

Section B: Short Answer Questions (Solve any five) **20 marks (4 marks each)**

Q.1. What do you mean by well posed learning problem? Explain with example of your choice.

Q.2 Write about parent selection process in Genetic algorithm.

Q.3 Explain locally weighted linear regression.

Q.4 Explain artificial neural network based on the perceptron concept with diagram.

Q.5 Explain the inductive bias with example.

Q.6 Write a brief outline on cross validation with respect to machine learning algorithms?

Q.7 What is the difference between Self Organizing Map (SOM) and K-means in terms of advantages for signal processing, clustering etc?

Section C: Long Answer Questions (Solve any two) **20 marks (10 marks each)**

Q. 1. Explain the significance of naming as Confusion matrix and its matrix representation for detection of "Spam- e-mails".

Q. 2. What is a Recommender System? How Machine Learning is useful in Recommender Systems? Explain with example.

Q.3 Given the following parents, P_1 and P_2, and the template T.

P_1	A	B	C	D	E	F	G	H	I	J
P_2	E	F	J	H	B	C	I	A	D	G
T	1	0	1	1	0	0	0	1	0	1

Show how the following crossover operators work

- Uniform crossover
- Order-based crossover

With regards to genetic algorithms

Q.4 Consider the given training examples which find malignant tumors from MRI scans:

Examples	Shape	Size	Color	Surface	Thickness	Target
1	Circular	Large	Light	Smooth	Thick	Malignant
2	Circular	Large	Light	Irregular	Thick	Malignant
3	Oval	Large	Dark	Smooth	Thin	Benign
4	Oval	Large	Light	Irregular	Thin	Benign
5	Circular	Small	Light	Smooth	Thin	Malignant

Show the specific and general boundaries of the version space after applying candidate elimination algorithm (Note: Malignant is +ve and Benign is –ve)

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