

19/11/19

Indian Institute of Engineering Science & Technology, Shibpur
Department of Computer Science & Technology

B.Tech Dual Degree 7th Semester Examination, 2019

Subject: Machine Learning

Code: CS721/III

Full Marks- 70

Time: 3hrs

Answer question No. 1 and any three from the rest

1. (i) What are the different steps of Machine Learning Process? 11×2
(ii) Write differences between supervised and unsupervised learning.
(iii) Choosing of right Machine Learning solution for your problem depends on which factors?
(iv) Define the Least square error function, used in ANN for multiclass classification.
(v) How non-linearly separable problem is converted to linearly separable problem?
(vi) Define **good margin** in connection with a linear SVM classifier.
(vii) Calculate number of weights in a fully connected layer of an ANN when images of size, $200 \times 200 \times 3$ are fed as inputs.
(viii) Write Hebbian learning rule.
(ix) What are the challenges of Back propagation algorithm?
(x) When RNN works better than LSTM network?
(xi) Write the cross entropy cost function.
2. Describe the role of convolution layer, pooling layer and fully connected layer in a CNN. Which activation functions are suitable for the convolution layers and why? 3×3+7
3. What do you mean by Gradient descent and why it is used in machine learning algorithms? What is learning rate and how it is related with minimization of loss function? What do you mean by Stochastic Gradient Descent Algorithm? 3+3+3+4+3
4. Describe the concept of cell state and functions of the gates used in the LSTM network to handle long term dependency of sequence words. What do you mean by back propagation through time? 4+8+4
5. What is the unique feature of Radial Basis Function Neural Network and how it is used for extracting patterns from the dataset? Describe how the Self organizing feature mapping network converts patterns of arbitrary dimensionality into the responses of one or two dimensional arrays of neurons. 2+6+8