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UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

End Semester Examination, May 2018

Program: M.Tech

Subject (Course): Artificial Neural Network and Applications

Course Code: CSAI7005

No. of page/s: 2

Semester – IInd

Max. Marks : 100

Duration : 3 Hrs

Section A

Note: All 4 questions are compulsory. Each question of Section A carries 7.5 marks.

1. Explain the biological prototype of neuron. Also, explain the characteristics of neuron. [CO1]
2. Explain the limitations of backpropagation learning. [CO2]
3. Discuss the difference between supervised and unsupervised learning [CO3]
4. Discuss practical applications that can and cannot have scope of artificial neural network. [CO4]

Section B

Note: Answer the questions. Each question of section B carries 15 marks.

5. List and explain various activation functions used in modeling of artificial neuron. Also explain their suitability with respect to application. [CO1]
6. Sketch architecture of RBF network and illustrate the steps for recall Procedure. [CO2]

(OR)

7. A 3 input 2-output NN has the weight values, $w_{11}=0.6$, $w_{12}=1.1$, $w_{21}=0.7$, $w_{22}=0.5$, $w_{31}=0.8$, $w_{32}=0.2$. It is given an input $[0.3 \ 0.7 \ 1.6]^T$. Assume the desired output to be $[1.5 \ 1.2]^T$, $\eta=0.6$ and $s=0.5$.
 - a. Find the value of the output if a binary sigmoid is used as a transfer function.
 - b. Find the new weights if the delta-learning rule is used.
 - c. Find the new weights if the widrow-off learning rule is used.
 - d. Find the new weights if the Hebbian learning rule is used.
 - e. Find the new weights if the Perceptron learning rule is used.
 - f. Assume the desired output to be $[1.5 \ 1.2]^T$, $\eta=0.6$ and $s=0.5$. [CO2]
8. What are different types of learning schemes used in training of artificial neural networks? Explain each of them clearly with suitable examples [CO3]

Section C

Note: Answer the questions. Each question of Section C carries 25 marks.

9. By quoting all necessary details in utilizing neural network as a platform for developing a image recognition system. Demonstrate how the end-to-end application can be developed that can recognize the image of a given candidate is available in the database or not.
[CO4]

OR

Explain the architectures of popular self-organizing maps. Also, explain how SOMs are used for data compression. **[CO4]**