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Paper Code : BDS402 AI & ML-2

UPID : 4000018

Time Allotted : 3 Hours *Full Marks :70*

The Figures in the margin indicate full marks.
Candidate are required to give their answers in their own words as far as practicable

Group-A (Very Short Answer Type Question)

1. Answer *any ten* of the following : [1 x 10 = 10]

(I) What is hopfied network?

(II) What is feature extraction?

(III) In feed forward information flow only in forward direction from I/P to O/P layer? (T/F)

(IV) What is MLP?

(V) What is backpropagation?

(VI) What is RBF?

(VII) SOM is used to increase dimensionality. (T/F).

(VIII) what is role of synapse?

(IX) What is role of padding in CNN?

(X) What is function of SOMA in biological neurons?

(XI) What is difference between single layer and multi-layer perceptron model?

(XII) What is full form of RNN?

Group-B (Short Answer Type Question)

Answer *any three* of the following : [5 x 3 = 15]

2. Describe the most common basis function used in RBF networks. [5]
3. Explain the basic concept of Kohonen's Self-Organizing Maps. [5]
4. Explain the limitations of Hopfield Networks in terms of storage capacity and stability. [5]
5. Name one common feature selection technique used in neural networks. [5]
6. What is the difference between underfitting and overfitting? [5]

Group-C (Long Answer Type Question)

Answer *any three* of the following : [15 x 3 = 45]

7. (a) What is role activation function? [3]
   (b) Describe different type of activation functions. [7]
   (c) What is difference between sigmoid and softmax activation function? [5]
8. (a) What is forward propagation? [3]
   (b) Describe the forward propagation process in a feedforward neural network. [6]
   (c) How are activation functions applied at each layer? [6]
9. (a) Discuss the computational complexity of RBF networks compared to MLPs. [8]
   (b) In what scenarios would you prefer RBF over the MLP? [4]
   (c) Give some applications of RBF. [3]
10. (a) Describe the architecture of a SOM, including input and output layers. [8]
    (b) Compare SOMs with k-means clustering. [7]
11. (a) Explain how RBF networks can be used for pattern recognition tasks. [8]
    (b) Include a specific application example in your answer. [7]

*** END OF PAPER ***