| 1.In which type of neural network, the data is grouped based on its distance from a center point?  a) Recurrent Neural Network  b) Modular Neural Network  c) Radial Basis Functions Neural Network  d) Convolution Neural Network |
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| 2.Which network has backward links from output to the input and hidden layers is called as \_\_\_\_   1. Self-organizing maps 2. Perceptions 3. Recurrent neural network   d)Multi layered perceptron |
| 3.Why is the XOR problem exceptionally interesting to neural network researchers?  a) because it can be expressed in a way that allows you to use a neural network  b) because it is complex binary operation that cannot be solved using neural networks  c) because it can be solved by a single layer perceptron  d) because it is the simplest linearly inseparable problem that exists |
| 4.A 4-input neuron has weights 1, 2, 3 and 4. The transfer function is linear with the constant of proportionality being equal to 2. The inputs are 4, 10, 5 and 20 respectively. The output will be:  a) 238  b) 76  c) 119  d) 123 |
| 5.What does RBF stand for?   1. Radial Basis Function 2. Recurrent Base Function 3. Recurrence Basic Function 4. Radial Basic Function |
| 6.Which network has backward links from output to the input and hidden layers is called as \_\_\_\_   1. Self-organizing maps 2. Perceptrons 3. Recurrent neural network 4. Multi layered perceptron |
| 7.In self-organizing network, how is layer connected to output layer?  a) Some are connected  b) all are one to one connected  c) each input unit is connected to each output unit  d) all are self connected |
| 8.What is the objective of back propagation algorithm?  a) To develop learning algorithm for multilayer feed forward neural network  b) To develop learning algorithm for single layer feed forward neural network  c) To develop learning algorithm for multilayer feed forward neural network, so that network can be trained to capture mapping implicitly.  d) To develop learning algorithm for single layer feed forward neural network, so that network can be trained to capture mapping implicitly. |
| 9.What type learning involved in ART?  a) Supervised  b) Unsupervised  c) Reinforcement  d) Supervised and unsupervised |
| 10.What is unsupervised learning?  a) Weight adjustment based on deviation of desired output from actual input  b) Weight adjustment based on desired output only  c) Weight adjustment based on local information available to weights  d) Weight adjustment based on input only |

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| 12.How many layer(s) an RBF network has?  a) One layer b) Two layers c) Three layers d) Zero layer |
| 13.Choose standard propagation and activation functions of RBF networks for the output layer.  a) Weighted sum, identity b) Identity, weighted sum c) Weighted sum, radial basis function d) Radial basis function, weighted sum |
| 14.Identify which technique is most complex to determine cluster centers and widths in RBFNN?  a) SOM b) K-means clustering c) Adaptive to learning process d) Fixed selection of centers and widths with even spacing |
| 15.Which layer is also called as RBF? a) Input layer b) Output layer c) Hidden layer d) Recognition layer |
| 16.Examine what is not true about recurrent backpropagation?  a) Also called backpropagation through time b) Uses unfolding c) Uses teacher forcing d) Uses many epochs |
| 17.Identify why does SOM network stiffen with the passage of time?  a) Because learning rates and neighborhoods are decreased over time b) Because training examples get exhausted c) Because no new neurons are added d) Because no weight adjustment happens in SOM |
| 18.What is the objective of feature maps? a) To capture the features in space of input patterns b) To capture just the input patterns4 c) Update weights d) To capture output patterns |
| 19.What is the main benefit of ART networks? a) Unsupervised learning b) Attain both stability and plasticity c) Attain stability without plasticity d) Attain plasticity without stability |
| 20.Judge SOM and ART.  a) Both are examples of unsupervised learning b) Only SOM is example of unsupervised learning c) Only ART is an example of unsupervised learning d) Neither are examples of unsupervised learning |
| 21.Which of the ART network improves the learning ability by implementing biological process? a) ART-1 b) ART-2 c) ART-3 d) ART-4 |

Important topics

| 1. | | Sketch the architecture of Elman network and explain the role of the context layer in an Elman network. | |
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| 2. | | Summarize the methods to determine centers and widths of RBF neurons. | |
| 3. | | Brief about Growing RBF networks. | |
| 4. | | List the applications of SOMs. | |
| 5. | | Define Topology function and explain how a learning neuron influences its neighbors? | |
| 6. | | Explain the steps involved in training SOMs. | |
| 7. | | Why Moore-Penrose pseudo inverse is used in system of equations? |
| 8 | | Compare RBF networks and multilayer perceptron |
| 9 | | Define Elman network with diagram. |
| 10 | | Evaluate why SOMs activate the neuron with least distance to on an input pattern? |
| 11 | | Elaborate competitive learning in SOM. |
|  | | Discuss the structure of ART network.  What is called Teacher forcing? brief about it  Explain the Components of RBF neuron.  Explain the Structure of RBF network with neat diagram. |

| 1.Explain about training recurrent networks. |
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| 2.Distinguish between Radian Basis Function Neural Network and Multi-layer Perceptron Feed-Forward Neural Network. |
| 3.What is ART? Explain the structure and learning process of an ART network. |
| 4.Discuss in detail about variations of SOMs. |
| 5.Explain in detail about the training of recurrent networks with suitable diagram. |
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| 6.How is information processed in an RBF Network? Explain with the help of 2-5-3 RBF network. |
| 7.Examine and explain in detail about the variations of SOMs. |
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| 8.List and discuss about the learning process and extensions of an ART network.  9.Explain about Jodan network in detail. |