1. The Jacobian matrix is said to be _ _ _ _ _ _ _ _ if its rank is less than min (N, W), N→total no .of examples used to train n/w, W total no. of tree parameters. →**Rank deficient**
2. Hessian matrix concerned with →**Second derivative**
3. To overcome the problem of systematic bias, we need to use _ _ _ _ _ →**Antisymmatric activation function**
4. Jacobian matrix is →**Rank deficient**
5. The numbers of linearly independent columns or rows in the matrix, whichever one is smallest is called →**Rank**
6. Back propagation algorithm mainly uses →**Partial derivatives**
7. Many neural network training problems are intrinsically _ _ _ →**Ill-conditioned**
8. _ _ _ of Hessian matrix have a profound influence on the dynamics of back- propagation learning →**Eigen values**
9. _ _ _ _ _ of the Hessian matrix provides a basis for pruning →**Inverse**
10. _ _ _ _ _ is basis to the formulation of second - order optimization methods as an alternative to back-propagation learning →**Hessian matrix**
11. The learning process may be viewed as a __ _ _ _ _ problem →**Curve-fitting**
12. When a network is _ _ _ _ _ _ _ _ , it loses the ability to generalize between similar Input-output patterns. →**Over trained**
13. For a good generalization,the size of the training set,N must satisfy the condition Where W Total no.of free parameters,ε->Fraction of classification errors permitted on test data (.) ->Order of quality enclosed within →**N=O (W ε)**
14. _ _ _ _ _ equation is in accordance with "Window's rule of thumb" for the LMS algorithm Where W→Total no. of free parameters, ε ->Fraction of classification errors permitted on test data (.) ->Order of quality enclosed within →**N=O (W ε)**
15. The curse of dimensionality was introduced by _ _ _ _ _ _ _ →**Richard Bellman**
16. The error between the empirical fit and the best approximation may be viewed as an→**Estimation error**
17. Universal approximation theorem concerned with _ _ _ _ _ _ numbers of hidden layers in a multilayer perceptron with an input-output mapping. →**Minimum**
18. In a 2-hidden layer n/w, local features are extended in _ _ _ _ _ _ _ _ _ _ layer to make the approximation process more manageable. →**First hidden layer**
19. In a 2-hidden layer n/w, global features are extracted in _ _ _ _ __ _ _ layer to make the approximation process more manageble. →**Second hidden layer**
20. _ _ _ technique is an example of a piecewise polynomial approximation→ **Spline**
21. If N is the size of the training set and W is the number of free parameters in the network, then the condition for nonasymptotic mode is →**N<W**
22. If N is the size of the training set and W is the number of free parameters in the network, then the condition for asymptotic mode is →**N>30W**
23. _ _ _ curve decreases monotonically for an increasing numbers of epochs in the usual manner →**Estimation learning**
24. _ _ _ _ _ curve decreases monotonically to a minimum it then starts to increase as the training continues →**Validation learning**
25. In cross-validation, training set is future partitioned into _ _ _ _ _ disjoint subsets. →**2**
26. _ _ _ _ _ _ _ subset is used to select the model →**Estimation**
27. _ _ _ _ _ _ _ _ _ _ subset is used to test or validate the model →**Validation**
28. "Validate the model on a dataset different from the one used for parameters estimation''. This motivates _ _ _ _ _ _ _ _ method. →**Cross-Validation**
29. Generally _ _ _ _ _ _ _ _ _ percentage of the training set is assigned to the estimation subset. →**80**
30. Generally _ _ _ _ _ _ _ _ _ _ _ percentage of the training set is assigned to the validation subset →**2**
31. *In* _ _ _ _ _ _ _ _ _ _ _ _ method the available set of N examples is divided into K subsets, where →**K > 1, and K is divisible into N.**
32. Which of the following methods have highest computational complexity for complexity regulation in multilayer perceptron → **Approximation smoother**
33. If N is the available numbers of labeled examples, _ _ _ _ _ _ _ _ _ examples are used to train the model in leave-one-out method → **N-1**
34. If N is the available numbers of labeled examples, _ _ _ _ _ _ _ _ _ examples are used to test the model in leave-one-out method →**1**
35. In leaving one out method with N labelled examples, the experimented is repeated for a total no. of _ _ _ _ times, each time leaving out a different example for validation → **N**
36. In network growing, we start with _ _ _ _ _ _ _multilayer perceptron. →**Small**
37. In network pruning, we start with _ _ _ _ _ _ _ multilayer perceptron. →**Large**
38. In _ _ _ _ rocedure, all the weights in the multilayer perceptron are treated equally. →**Weight decay**
39. Which method distinguishes between the roles of synaptic weights in the hidden layer and those in the output layer. → **Approximate smoother**
40. Which method is better for complexity regulation in multilayer perceptrons → **Approximation smoother**
41. In a multilayer perceptron containing a total of W synaptic weights, the computational complexityof Back-Propagation algorithm is →**O(W)**
42. Which of the following algorithm concerned with "locality constraint" →**Back-Propagation**
43. The sensitivity of an input-output mapping function F w.r.t. a parameter of the function, denoted by W, is defined by →S^F_W=((θF/F)/(ΘW/W))
44. Which of the following pair of algorithms belongs to the class of H ∞ - optipal filters→ **LMS & Back-Propagation**
45. Which of the following algorithm is stochastic in nature. →**Back-Propagation**
46. _ _ _ is an application of a statistical method known as stochastic approximation. → **Back-Propagation learning**
47. The hidden neurons of a multilayer perceptron trained with the _ _ _ _ _ _ _ _ _ algorithm plays a critical role as feature detectors. **Back-Propagation**
48. Which of the following algorithm is an example of a connectionist paradigm → **Back-Propagation**
49. "Predicate Order'' is used to measure _ _ _ _ _ _ _ _ of a computational task →**Size or complexity**
50. _ __ _ _ _ is basically a hill climbing technique. **Back-Propagation**
51. Computational complexity of Quasi-Network method, where W is the size of weight vector w. →**O (W 2)**
52. Among second order optimization methods, which is applicable to large scale problems.

→Conjugate-gradient method

53. Conjugate-gradient method belongs to a class of _ _ _ _ _ _ _ _ _ order optimization methods. → Second
54. _ _ _ _ _ _ _ _ _ _ is an iterative procedure that generates a sequence of estimates for each iteration of the conjugate-gradient algorithm →Line search Algorithm
55. Computational complexity of the conjugate-gradient method, where W is the size of the weight vector w. → **O(W)**
56. Conjugate-direction methods are _ _ _ _ _ _ _ order optimization methods. →**Second**
57. Any line search algorithm has _ _ _ _ _ _ _ _ _ phases.→**2**
58. _ _ _ _ _ _ _ _ _ _ phases of a line search algorithm searches for a bracket. →**Bracketing**
59. In _ _ _ _ _ _ _ _ _ _ phases of a line search algorithm, the bracket is sectioned (divided). →**Sectioning**
60. Quasi-Network method use _ _ _ _ _ _ order (curvature) information about the error surface without actually requiring knowledge of the Hessian matrix H. → **Second**
61. _ _ _ _ _ _ _ _ _ _ model is specialized to mapping where the input dimension is the same as the output dimension. → **Kohonen model**
62. Kohonen model belongs to the class of _ _ algorithms → **Vector-coding**
63. _ _ _ _ _ _ _ _ _ _ model facilitates data compression. →**Kohnen model**
64. Which model contains 2 separate two-dimensional lattices of neurons connected together, with one projecting onto the other. → **Willshaw-Vonder model**
65. Self-Organizing maps are based on _ _ _ _ _ _ . → **Competitive learning**
66. Kohonen model is an example of _ _ _ _ _ _ _ _ _→Feature mapping model
67. Kohonen model can be derived in _ _ _ _ _ _ ways. →**2**
68. _ _ _ _ _ _ _ _ _ _ approach uses a model involving an encoder and a decoder. →**Vector quantization**
69. In Willshaw-vonder model, input neurons are called as _ _ _ _ _ _ _ _ neurons. → Presynaptic
70. In Willshaw-vonder, output neurons are called as _ _ _ _ _ _ _ _ neurons. → Postsynaptic
71. Once the network has been properly initialized, what are the essential processes involved in the formation of self-organizing map. → Competition, Cooperation, Synaptic adaptation
72. _ _ _ _ _ _ _ _ _ _ _ _ provides the basis for competition among the neurons. → Discriminant function
73. In _ _ _ _ _ _ _ _ _ _ _ process, the winning neuron determines the spatial location of a topological neighborhood of excited neurons → Cooperation
74. _ _ _ _ _ _ _ _ _ process enables the excited neurons to increase their individual values of the discriminant function in relation to the input pattern. → Synaptic Adaptation
75. In which phase of the adaptive process topological ordering of the weight vectors takes place → Self-organizing
76. Which phase of the adaptive process is needed to fine tune the feature map →Convergence
77. Random numbers generator is used for _ _ _ _ _ _ _ _ in the network. → Initializing synaptic weights
78. Once the network has been properly initialized, these are _ _ _ _ _ _ _ _ _ _ _ essential processes involved in the formation of self-organizing map. →3
79. Winner neuron can be declared in _ _ _ _ _ _ _ _ _ process →Competition
80. Adaptive process is divided into _ _ _ _ _ _ _ _ phases →2
81. As a general rule, the number of iterative constituting the convergence phase must be at least _ __ _ _ _ _ _ _ _ _ _ _ _ _ times the number of neurons in the network →500
82. The ordering phase may take as many as _ _ _ _ _ _ _ _ _ iterations of the SOM algorithm and possibly more →1000
83. What are the 3 basic steps involved in the application of the SOM algorithm after initialization → Sampling, similarity matching, Updating
84. In which step of the SOM algorithm, a sample is drawn from the input space with a certain probability → Sampling
85. In which step of the SOM algorithm, best-matching (winning) neuron can be found → Similarity matching
86. In which step of the SOM algorithm, the synaptic weight vectors of all neurons are adjusted by using the update formula → Updating
87. The Self-organizing phase of adaptive process is also called as _ _ _ _ →Ordering phase
88. How many basis steps involved in the application of the SOM algorithm after initialization →3
89. In which step of the SOM algorithm random values are chosen for the initial weights vectors. →Initialization
90. In SOM algorithm, best matching neurons can be found by using _ _ _ _ criterion. → Minimum-distance Euclidean
91. The feature map computed by the SOM algorithm tends to _ _ _ _ _ _ _ _ regions of _ _ _ _ _ _ __ _ input density. →Overrepresent, Low
92. The _ _ _ _ _ _ _ _ _ _ _ _ _ _ computed by the SOM algorithm displays important stastical Characteristics of the input space. →Feature map
93. _ _ _ _ algorithm provides a good approximation to the input space →SOM
94. Self-organizing features maps can be viewed as a _ _ _ _ _ _ _ _ generalization of principal components analysis. →Non Linear
95. The necessary conditions for the minimization of the expected distortion are embodied in the _ _ _ _ _ _ _ _ algorithm → Generalized Lloyd algorithm
96. _ _ _ _ _ _ _ _ is the output of the SOM algorithm. → Feature map
97. In feature map, the input space is _ _ _ _ →**continuous**
98. In feature map, the out space is _ _ _ _ → **Discrete**
99. SOM algoritms is _ _ _ algorithm →**vector Quantization**
100. _ _ _ algorithm is closely related to the SOM algorithm. →Generalized Lloyd algorithm
101. The second step in pattern classification is _ _ _ _ _ _ _ _ _ _ _ _ . → **Classification**

102. The combination of a self-organizing map and a supervised learning scheme Forms the basis of an_ _ _ →**Adaptive pattern classification**
103. Adaptive pattern classification is _ _ _ _ _ _ _ _ _ in nature. →**Hybrid**
104. _ _ _ _ _ _ _ _ _ _ is a technique that exploits the underlying structure of input vector for the purpose of data compression. →**Vector Quantization**
105. The first and most important step in pattern classification is _ _ _ →**Feature selection**
106. The collection of possible reproduction vector is called _ _ _ _ _ _ _ of the quantizer. →**Code Book**
107. Members of the code book are called _ _ _ _ _ _ _ →**Code words**
108. A vector quantizer with minimum encoding distortion is called a _ _ → **Voronoi**
109. Nearest-neighbor quantizer is also called as _ _ _ _ _ _ →**Vorono**
110. LVQ is a _ _ _ _ _ _ _ _ _ _ _ Technique. →**Supervised Learning**
111. LVQ technique uses _ _ _ _ _ _ _ _ _ information to move the Voronoi vectors. →**Class**
112. The way in which time can be built into the operation of a neural network in an implicit manner is through the use of _ _ _ _ _ _ _ →**Feedback**
113. The subject of neural networks viewed as nonlinear dynamical systems with particular emphasis on the stability problem is referred to as _ _ _ → Neurodynamics
114. There are _ _ ways of applying feedback to a neural network. →**2**
115. _ _ _ _feedback is applied at the level of a single neuron in side the network. →**Local**
116. Which feedback encompasses the whole network. →**Global**
117. Neural networks with one or more feedback loops are referred to as _ _ _ _ _ → **Recurrent networks**
118. Neurodynamics need a _ _ _ _ _ _ _ _ _ _ for describing the dynamics of a nonlinear system. **Mathematical model**
119. State-space model is a _ _ _ _ _ _ _ _ _ _ →**Mathematical model**
120. Which of the following model uses state variables →**State-space model**
121. How many trajectories will pass through an initial state for an autonomous system. →1
122. The motion of the space of states with in itself is called _ _ _ _ _ _ _ _ of a dynamical system →**Flow**
123. If x and u are a pair of vectors in an open set and F(x) be a vector function and ||x|| denote the noun of the vector x then which of the following is the lipschitz condition →**||F(x)-F(u)|| ≤ K||x-u||**
124. The curve which represents the changes in the state of the system with time t is called _ _ _ _ →**Trajectory**
125. Trajectory of a system is also called as _ _ _ _ _ _ _ _ →**Orbit**
126. The instantaneous velocity of the trajectory is represented by _ _ _ _ _ **Tangent vector**
127. The family of trajectories, for different initial conditions is referred to as the _ _ _ _ _ _ _ of the system. →State portrait
128. A nonlinear dynamical systems for which the vector function F(x (t)) does not depend explicitly on time t is said to be _ _ _ _ _ _ _ → Autonomous
129. A nonlinear dynamical system for which the vector function F(x (t)) depend explicitly on time t is said to be _ _ _ _ _ _ _ → Non autonomous
130. A dynamical system is a system whose state varies with _ _ _ →Time
131. The Equilibrium state is said to be _ _ stable if it is both stable and convergen→ Asymptotically
132. If type of Equilibrium state is stable node, then Eigen values of the Jacobian matrix are → Real and Negative
133. If type of Equilibrium sate is Unstable node, then Eigen values of the Jacobian matrix are →Real and Positive
134. If type of Equilibrium sate is Saddle node, then Eigen values of the Jacobian matrix are → Real with opposite sign
135. If type of Equilibrium sate is Center, then Eigen values of the Jacobian matrix are → Conjugate purely imaginary
136. Modern stability theory was founded by _ _ _ _ _ _ _ → Lyapunov
137. Direct method of Lyapunov makes use of a function called _ _ _ →Lyapunov function
138. A constant vector x ε M is said to be in _ _ _ _ _ state of the system if F(x)=O, Where O is the null vector. → Equilibrium
139. Equilibrium state is also called as _ _ _ _ _ state →Stationary
140. The Equilibrium state is also referred to as a _ _ _ _ Singular point
141. The manifold which consist of a single point in the state space is concerned With _ _ _ _ _ _ _ _ →**Point attractor**
142. Each attractor is encompassed by a distinct region of its own such a region is called _ _ _ _ _ _ of attraction. → Basin
143. An attraction is said to be _ _ _ _ _ _ _ _ if all the eigen values of the Jacobian matrix have an absolute value less than 1. → Hyporbolic
144. _ _ _ _ _ _ _ _ _ attractors are of particular intrest in the study of a problem known as the vanishing gradients problem. →Hyporbolic
145. Vanishing gradient problem arises in dynamically driven _ _ _ _ _ _ _ networks. →Recurrent.
146. A limit cycle constitutes an oscillatory behaviour that marises when an equilibrium point of a nonlinear system becomes _ _ _ _ _ _ _ _ →Unstable.
147. Basin of attraction is also called as _ _ _ _ _ _ _ of attraction →Domain
148. The boundary separating one basin of attraction from another is called a _ _ _ _ _ →separatrix
149. Limit cycle are particularly characteristic of _ _ _ _ _ _ _ _ order systems. →second
150. Manifolds are called as _ _ _ _ _ _ _ _ _ _ _ → Attractors
151. Which of the following is not a characteristic of the neurodynamic system →Linearly
152. Additive & related neurodynamic models are related to each other by _ _ _ , _ _ _transformation. → Linear, Invertible
153. Which of the following model uses Kirchhoff's current law. a. Additive
154. The Hopfield network and Brain-state-in-a-box model are example of an _ _ _ _ _ _ Memory with no hidden neurons. →Associative
155. Which model is concerned with the concept of "Energy Minimization'' →Hopfield

156. The human cortex possess about _ _ _ _ _ _ _ billion neurons. →10
157. A neurodynamical system is _ _ _ _ _ _ →Non-Linear
158. A neurodynamical system is _ _ _ _ _ _ →Dissipative
159. Which model is useful for clustering types of applications → Brain-state-in-a-box
160. In Hopfield network the number of feedback loops is _ _ _ _ _ _ _ _ _ _ to the number of neurons →Equal
161. The presence _ _ _ _ _ _ _ _ surface is an intrinsic characteristic of the Hopfield network. →**Null**
162. _ _ _ _ _ _ _ _ _ _ states represent stable states of the Hopfield network that are different from the fundamentals memories of the network. → **Spurious**
163. _ _ _ _ _ _ _ _ _ model is useful as a content addressable memory. →**Hopfield network**
164. _ _ _ _ _ _ _ _ _ _ model is useful as an analog computer for solving combinational-type →**Optimization problems.**
165. Which of the following is energy minimization model→**Hopfield network**
166. The Hopfield network can be operated in _ _ _ _ _ _ _ _ models depending on the model adopted for describing the neurons. →**2**
167. The continuous mode of Hopfield network is based on _ _ _ _ _ _ _ _ _ model. → Additive
168. The discrete mode of Hopfield network is based on _ _ _ _ _ _ _ _ model. → McCulloch-Pitts
169. There are _ _ _ _ _ _ _ _ phases to the operation of the discrete Hopfield network as a content-addressable memory. →2
170. At what value of load parameter,Hopfield network breaks down→0.14
171. Fundamental memories are also called as _ _ _ _ _→ Prototype states
172. The reciprocal of signal to noise ratio is called _ _ _ _ _ _ _ _ _ _ _ → Load parameters
173. The signal-to-noise ration is represented by _ _ _ _ _ _ _ _ _ _ _ →ρ
174. Hopfield network breaks down at _ _ _ _ _ _ _ _ _ _ →Critical value
175. A major limitation of the Hopfield network is _ _ _ _ _ _ →Its storage capacity must be maintained small
176. The attractor fixed points of the state space of the network are the _ _ _ _ _ _ _ of the network. →Fundamental memories
177. Load parameter is represented by _ _ _ _ _ _ _ _ _ →q
178. Storage capacity of the Hopfield network scales essentially _ _ _ _ _ with the size of the network → Linearly
179. Manifold are called as _ _ _ _ _ _ _ _ _ _ → Attractors
180. Generalization does not influenced by _ _ _ _ _ _ _ → The size of the test set
181. In _ _ _ _ _ _ _ procedure the complexity penalty term is defined as the squared norm of the weight vector. → Weight decay
182. _ _ _ _ _ _ _ _ _ _ _ _ _ favor the use of parallel architectures as an efficient method for the implementation of artificial neural networks. →Synaptic weights
183. Back-Propagation is a specific technique for implementing _ _ _ _ _ _ _ _ _ _ in weight space for a multilayer feed forward network. →Gradient descent
184. The eigen structure of the Hessian matrix has a profound influence on the _ _ _ _ _ _ Properties of the LMS algorithm. → Convergence
185. The eigen structure of the Hessian matrix has a profound influence on the _ _ _ _ _ _ Properties of the LMS algorithm. → Convergence
186. If λ_{max} is the largest eigen value of the Hessian and λ_{min} is it's smallest nonzero eigen value then condition number is _ _ _ _ _ _ _ →$\lambda_{min}/\lambda_{max}$
187. "Learning process" means _ _ _ _ _ _ _ _ →Training of a neural networks
188. The essence of Back-Propagation learning is to _ _ _ _ _ _ _ _ an input-output Mapping into the synaptic weights and thresholds of a multilayer perceptron→ Encode
189. The learning process may be viewed as a _ _ _ _ _ _ _ _ problem. →Curve-fitting
190. In order to produce a significant improvement in the convergence performance of a multilayer perceptron, we have to use _ _ _ _ _ _ _ _ order information in the training process →Higher
191. Which of the following is not a performance measure for Back-Propagation algorithm. →Sensitivity ratio
192. For a given epoch of training data, the Back-Propagation algorithm operates in one of _ _ _ _ _ ___ _ _ _ _ modes →2
193. In _ _ _ _ _ _ _ mode of the Back-propagation algorithm the synaptic weights of all neurons in the network are adjusted on a pattern-by-pattern basis.→ Sequential
194. In _ _ _ _ _ _ _ _ mode, the adjustments to all synaptic weights and biases are made on epoch-by-epoch basis. → Batch
195. Among the 2 modes of Back-Propagation learning which mode is faster one ? → Batch
196. Steepest-descent method operates on the basis of a _ _ _ _ _ _ _ _ approximation the Cast function. →Linear
197. Sequential mode of Back-Propagation algorithm is also called as _ _ _ _ _ _ _ _ mode. →Stochastic
198. The self-Organizing map may also be viewed as a _ _ _ _ _ _ _ _ → Vector Quantizer
199. In kohonen feature mapping model the output neurons are arranged in a _ _ _ _ _ _ _ _ _ _ dimentional lattice → two