BIRLA INSTITUTE OF TECHNOLOGY AND SCIENCE, PILANI

Neural Networks & Fuzzy Logic (BITS F312) [1st Semester, 2018-2019]

Mid-Semester Exam - Part A (closed book)

Max Time- 15 min | Max Marks - 30 | Date: 12.10.2018

NAME	ID NO.

Answer in the space provided. You may use the first page of your answer book for the open book component for rough work for this section.

Q1. If y = f(net) = 0.6, and 'f' is tanh with slope of 0.5, then f'(net) = _____ [1]

Q2. Maximum slope of logsigmoid activation function with slope 1 is: _____ [1]

Q3. _____ does not take into account the value of error gradient, but rather considers only the sign of the error gradient to indicate the direction of the weight update. [1]

Q4. The MATLAB command p = [-0.5 1 ; -0.25 1; -1 0.25 ; -1 0.5] indicates that number of patterns are: _____ [1]

Q5. 'Early stopping' technique is used to avoid a phenomenon called _____ [1]

Q6. The preferred Loss function over MSE for classification problems is: _____ [1]

Q7. The type of learning which combines competitive learning with a topological structuring of nodes such that adjacent nodes tend to have similar weight vector is known as _____ [1]

Q8. The performance of _____ network depends considerably on number of target attractor patterns that are to be stored. [1]

Q9. Prof. _____ of the Computer Science department at the University of Toronto first demonstrated the use of generalized backpropagation algorithm for training multi-layer neural nets. [1]

Q10. "Because precision is costly, it makes sense to minimize the precision needed to perform a task" is a famous quote attributed to Prof. _____ [1]

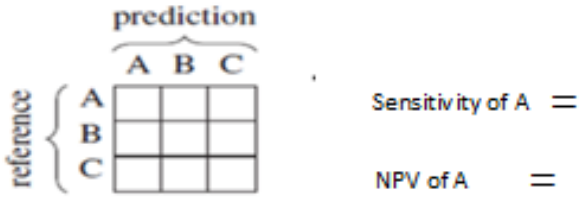
Q11. Ian Goodfellow came up with the idea of a new technique in which different neural networks challenged each other to learn to create and improve new content in a recursive process. The full name of the network based on this technique is: _____ [1]

Q12. Yann LeCun and Yoshua Bengio In 1995, introduced the concept of a type of neural network which helps in extremely precise image recognition. The network is named _____ [1]

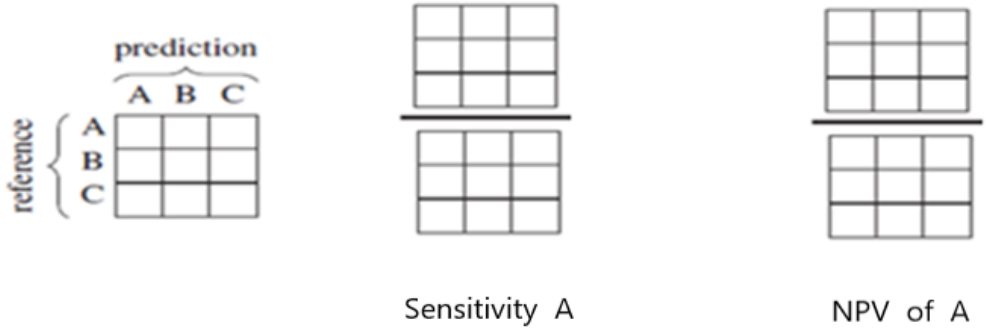
Q13. _____ is an AI accelerator application-specific integrated circuit (ASIC), working as coprocessor, developed by Google specifically for neural network machine learning. [1]

Q14. Controller influences the controlled system via control signal called _____ variable [supplying Energy/Matter] so that the value of the controlled variable equals the value of the set point. [1]

Q15(a) For the confusion matrix given below, write the expression for Sensitivity of A and NPV of A in terms of TP/FP/TN/FN [2]



(b) Fill the boxes with (TP/FP/TN/FN) in numerator and denominator for (i) Sensitivity of A (ii) NPV of A. [2+2=4]



Q16. The long-term memory in LSTM is called _____ state, and is denoted as _____ [1]

Q17. Full name of RNN in which output gate is given by $o_t = \sigma(W_o.[c_t, h_{t-1}, x_t] + b_o)$ is _____ [1]

Q18. The schema **10**11*0 has an order of _____ and defining length of _____ [2]

Q19. If mutation probability is 0.1 then the probability that the above schema (in Q18) survives bitwise mutation is: _____ [2]

Q20. Among (i) Roulette wheel (ii) Ranking and (iii) Tournament selection schemes, the one that will never select the worst performing string is: _____ [2]

Q21. In PSO algorithm, velocity update has the following three components:

inertia, _____ and _____ [2]