1. We know that the VC dimension of a set of lines in 2D is 3. What is the VC dimension of a set of planes in 3D?
   - 1.1 $3+1=4$
   - 1.2 $2+2=2$
   - 1.3 $2 \times \frac{3}{4} = 6$
   - 1.4 Remains the same. i.e., 3
   - 1.5 None of the above

   Ans A urlhttp://work.caltech.edu/slides/slides07.pdf proves that VC dimension for linear perceptron in R^d is $d+1$

2. Make the necessary minimal changes (if any required) and rewrite as true sentences in the space provided. Avoid changing the words in bold.
   A Single Layer Perceptron **can solve ExOR problem**.
   FIB A multi layer perceptron can solve ExOR problem.

3. We know that $\tanh(x) = \frac{e^x - e^{-x}}{e^x + e^{-x}}$. What is the derivative of $tanh(x)$
   - 3.1 $1 + \tanh(x)$
   - 3.2 $1 - \tanh^2(x)$
   - 3.3 $\tanh(x)(1 - \tanh(x))$

3.4 $1 + \tanh^2(x)$
3.5 None of the above

Ans: B

4. Make the necessary minimal changes (if any required) and rewrite as true sentences in the space provided. Avoid changing the words in bold.
Backpropagation algorithm *can guarantee (always find) the optimal solution/weights* **for a Multilayer Perceptron**.
FIB Backpropagation algorithm can not guarantee (always find) the optimal solution/weights for a Multilayer Perceptron. (MLP loss functions are non-convex in general)
5. An MLP has two inputs, two hidden layers of 3 neurons each and an output of two neurons. All the neurons have biases. The number of weights (or learnable parameters) is:
5.1 24
5.2 21
5.3 29
5.4 37
5.5 None of the above

Ans: C 3*(2+1) + 3*(3+1) + 2*(3+1)