Quiz 6 Solution

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1 Q1

Answer: A
Follow the chain rule and it would be easy to find the solution. D is a trap. f actually contains two terms (d and e) both of which are related to b. Actually,

$$\frac{\partial f}{\partial b} = \frac{\partial f}{\partial d}\frac{\partial d}{\partial b} + \frac{\partial f}{\partial e}\frac{\partial e}{\partial b} \tag{1}$$

Although A is not completely expanded, it is correct.

2 Q2

Answer: False
Multi-layer NN will still be linear if it does not have non-linear activations.

3 Q3

Answer: False
Initialization matters. It affects which local optimum your algorithm falls into.

4 Q4

Answer: C
Enumerate all cases of A and B. Compute the output. The result matches the truth table of XOR.

A	B	X	Y	Z
0	0	0	1	0
0	1	1	1	1
1	1	1	0	0
1	0	1	1	1

5 Q5

Answer: D
$5 * 5 + 5 + 5 * 3 + 3 = 48$ Do not forget the bias.

6 Q6

Answer: True
Look at the curve of sigmoid function. It is quite flat (gradient is very small) when the input is above a threshold. In this case, the gradient computed from back propagation can be very small.

7 Q7

7.1
Answer: C
Take conjuction of all positive cases.
7.2
Answer: True
$x_1 = 1$ for all positive cases. And 0 for all negative cases.
7.3
Answer: False
The last example contradicts.
7.4
Answer: True
7.5
Answer: False