**1.** Compute the variance of the uniform noise distribution function $(b > a)$: 1 point

$$p(z) = \begin{cases} \frac{1}{b-a} & \text{for } a \leq z \leq b \\ 0 & \text{otherwise} \end{cases}$$

- $\frac{(a+b)^2}{2}$
- $\frac{(b-a)^2}{12}$
- $\frac{a+b}{2}$
- 0

**2.** What is the probability distribution function of salt-and-pepper noise? 1 point

- $p(z) = \begin{cases} P_a & \text{for } z = a \\ 0 & \text{otherwise} \end{cases}$
- $p(z) = \text{constant}$
- $p(z) = e^{-z}$
- $p(z) = \begin{cases} P_a & \text{for } z = a \\ P_b & \text{for } z = b \\ 0 & \text{otherwise} \end{cases}$

**3.** Consider a constant image (a single pixel value in the whole image). Assume we add Gaussian noise to the image. How many Gaussian functions (distributions) will appear in the histogram of the noisy image? 1 point

- One
- Two
- Three
- None

**4.** Consider a constant image (a single pixel value in the whole image), not white nor black. Assume we add salt-and-pepper noise to the image. How many delta functions (distributions) will appear in the histogram of the noisy image? 1 point

- One
- Two
- Three
- None

**5.** What filter would you apply to restore an image corrupted by additive Gaussian noise and motion blur if your goal is to minimize the expected mean squared error between the original image and the restored one? 1 point

- Wiener filter
- Median filter
- No filter can restore Gaussian additive noise
- Local average filter

**6.** Do you consider you understand the difference between image enhancement and image restoration? There is no wrong answer here. 1 point

- Yes
- No

**7.** Consider we have an image composed of three constant flat regions. In other words, every line looks like $\cdots cccdddd \cdots$ , $eeee \cdots$, where $c$ is a given gray value, $d$ another, and $e$ yet another. Assume $c > d$ and $e > d$. We want to compress the image and select to apply a simple predictor such that the current value is predicted as equal to the previous one just to its left (ignore boundary pixels). The prediction error is better modeled as 1 point

- There will be no prediction error
- Exponential
- Salt and pepper
- Gaussian

**8.** Assume we have the same image as in the previous question, and we add to it Gaussian noise with zero mean. Assume we apply the same type of prediction. The prediction error is now better modeled by 1 point

- A single Gaussian mode
- Three Gaussian modes
- A constant distribution
- Two Gaussian modes

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I, **Tomáš Majda**, understand that submitting work that isn't my own may result in permanent failure of this course or deactivation of my Coursera account.*

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