1. Question: Do the pre/de-emphasis filters try to suppress the noise?

   Answer: I would answer a YES to your question but would like to add that such a description may be a little over-simplified. Pre/de-emphasis filtering technique is a process to shape the magnitudes of certain frequency bands with respect to the magnitudes of other frequency bands in order to improve the overall signal-to-noise ratio. So to speak, they shape the PSDs of the signals passing through them. Since the overall signal-to-noise ratio is improved, you may say that the noise has been consequently suppressed.

2. Question: On Slide 2-159, why is $S_{N_Q}(f) = N_0$ rather than $S_{N_Q}(f) = N_0/2$? I feel sort of confused with the relation among $S_{N_Q}(f)$, $S_{N_I}(f)$, $S_N(f)$ and S_W? Is $S_{N_I}(f) = S_{N_Q}(f)$?

   Answer: It has been derived on Slide 1-229 that $S_{N_Q}(f) = S_N(f - f_c) + S_N(f + f_c)$ for $|f| < B_T/2$. Since $S_N(f) = N_0/2$ for $|f - f_c| < B_T/2$ and also for $|f + f_c| < B_T/2$, we have

   $$S_{N_Q}(f) = S_N(f - f_c) + S_N(f + f_c) = N_0/2 + N_0/2 = N_0.$$

   Note that the above relation is valid as long as

   $$N(t) = N_I(t)\cos(2\pi f_c t) - N_Q(t)\sin(2\pi f_c t).$$

   (This stresses the importance of the derivations on Slides 1-227 $\sim$ 1-229 even if these contents are out of the scope of all exams.)

   For the second part of your question, $w(t)$, which is the noise before passing through the ideal bandpass filter, is assumed to be an ideal white noise; so, its PSD is equal to a constant $N_0/2$. On Slide 2-159, $N(t)$ is supposed to be the filtered white noise, which is the noise at the output of the ideal bandpass filter; so its PSD is equal to $N_0/2$ if $|f \pm f_c| < B_T/2$, and zero, otherwise. $N_I(t)$ and $N_Q(t)$ are two lowpass equivalent noises characterized by $N(t) = N_I(t)\cos(2\pi f_c t) - N_Q(t)\sin(2\pi f_c t)$; their PSDs are the same and are related to $S_N(t)$ via the formula derived on Slides 1-227 $\sim$ 1-229.

   For the last part of your question, my answer is, "Yes, $S_{N_I}(f) = S_{N_Q}(f)$." This has been proved on Slides 1-227 $\sim$ 1-229.

3. Question: What is the difference between $\mathrm{SNR_I}$ and $\mathrm{SNR_C}$?

   Answer: By definitions, $\mathrm{SNR_I}$ is the ratio of the average power of the modulated signal $s(t)$ to the average power of the filtered noise $n(t)$, while $\mathrm{SNR_C}$ is the ratio of the average power of the modulated signal $s(t)$ to the average power of the channel noise in the message bandwidth, measured at the receiver input.

   Hence, from the above definitions, the blue-colored texts are the same. Their definitions only differ in the calculation of the noise power. In short, $\mathrm{SNR_I}$ considers "unprocessed" filtered while noise, while $\mathrm{SNR_C}$ concerns "(perfectly) processed" filtered while noise, which is the noise remained in the message bandwidth at the very last processing stage.