Quiz I – CS B

EE402 Digital Image Processing - spring 2018

Time Allowed: 15 mins

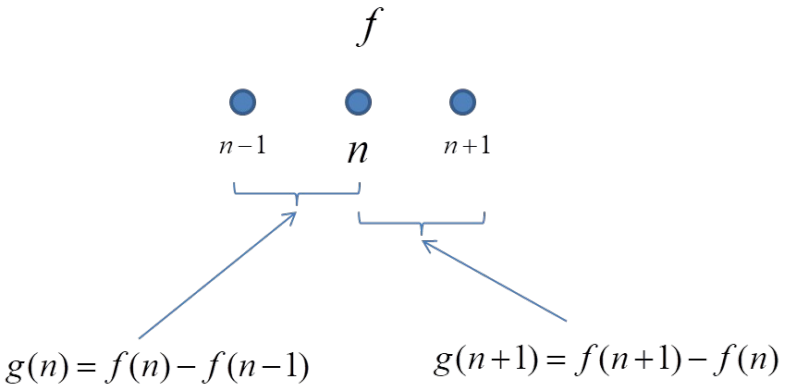
Instructions: There is only 1 problem in this exam. You can use your notes and books.

Problem 1: We want to design a filter for calculating 2nd derivative of an image (in *x* direction only), just as we made a filter to find 1st derivative. Assume that the first derivative can be found by taking the following difference:

$$g(n) = f(n) - f(n-1)$$

$$g(n+1) = f(n+1) - f(n)$$

as illustrated in figure.



We can find the 2nd derivative $h(n)$ by applying the same rule on g

Find a 3 x 3 kernel that when applied to image *f*, calculates its second horizontal derivative. You can begin by writing $h(n)$ in terms of ***f.***