Question 1

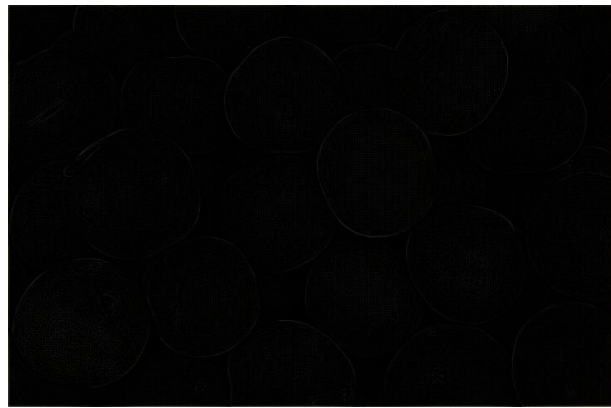A) Gaussian and Laplacian Pyramid:

Level: 0   Level: 0

Level: 1   Level: 1

Level: 2   Level: 2

Level: 3   Level: 3

Gaussain Pyramid   Laplacian Pyramid
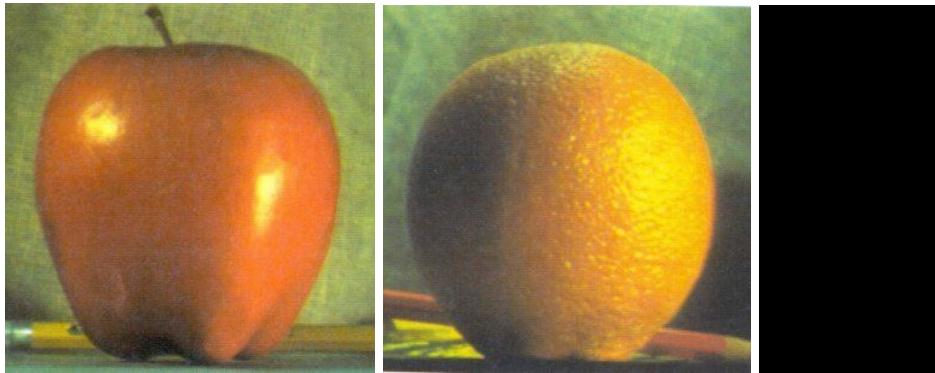
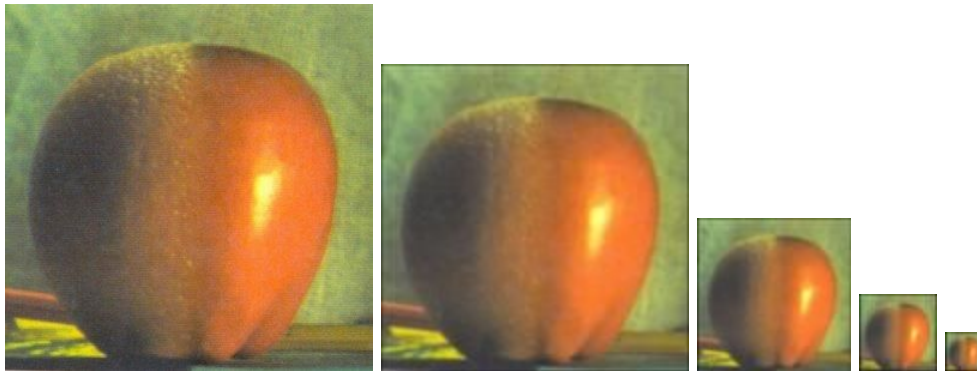Fig 1: 3-Level Pyramid

B) Image Blending:

Fig 2: Input Images

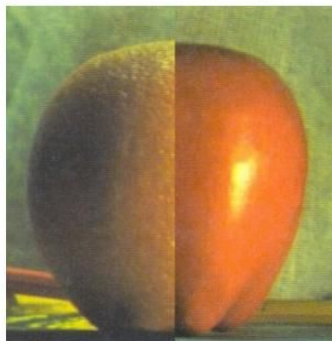Fig 3: Output laplacian Blend Images from zero level to top level

Fig 4: Normal Blend Image

Observation: As we can see,Blending using laplacian pyramids is smooth than normal belnd using mask

C)Upscaling:

<div style="display:flex">
Fig 5: Nearest Neighbour   Fig 6: Bilinear
</div>

Fig 7: Linear(scale in horizontal direction)

Fig 8: Bicubic

Question 2

A) FFT:

B) Filters

Fig 8: Ideal Lowpass, Ideal highpass
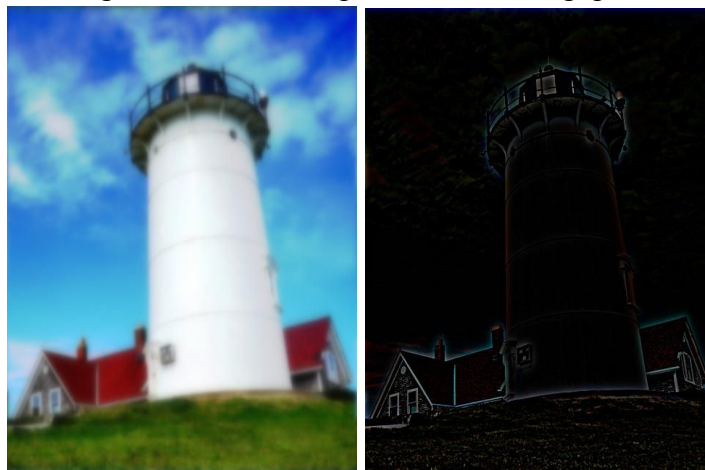

Fig 9: Gaussian Lowpass, Gaussian highpass

Fig 9: Butterworth Lowpass, Butterworth highpass

Observation: We can see ringing effect in ideal low pass filter and we get smoother images when we go to gaussian and butterworth filters.

C) Laplacian Filter:

Fig 10: Enhancement using Laplacina filter

Observation: Edges are enhanced

D) Notch filters: