1. What information does the Fourier representation of an image highlight, and what cases would it be used. Answer in 2 lines only.[2]

2. Explain a procedure of converting a grayscale image of 256 levels to a binary image (bi-level) using bit place slicing. Which bit plane would you suggest on using and why?[4]

3. Derive a method for updating the 3 by 3 convolution result of a Laplacian filter instead of having to re-compute at each pixel. Your method should take the minimum number of computations possible to compute the response at adjacent pixels.[6]

4. What affect would the spatial filler in figure b have on an image generated using the pattern in figure a repeated along the vertical and horizontal direction?[4]

5. Can the transformation function for histogram equalization of an image have a negative slope (i.e. it would appear as a line coming down as intensity increases)? Justify your answer.[6]

6. Write down the algorithm/pseudo-code for drawing a stellation from an N-gon. Your procedure should take as inputs the degree (N) of the polygon, the center coordinates(xc,yc), the radius (R) of the N-gon and the orientation (θ₁) of the N-gon with the x-axis.[4]

7. Derive the transformation matrix for rotation by angle theta about the y-axis. [4]