

## 2008 Paper 3 Question 4

### Computer Graphics and Image Processing

- (a) Most liquid crystal displays divide a pixel into three sub-pixels coloured red, green, and blue. Explain why this is so. [4 marks]
- (b) Some liquid crystal displays divide a pixel into four sub-pixels coloured red, green, blue, and white. Explain why this might be useful, what advantages it has, and what limitations it has. [6 marks]
- (c) Compare and contrast half-toning and error diffusion. Include in your answer an explanation of the situations in which each is superior to the other. [6 marks]
- (d) One method of anti-aliasing is to sample at high resolution,  $n \times n$  higher than the final image, and then to average each block of  $n \times n$  pixels to give a single pixel value. Discuss the advantages and disadvantages of using
- (i) Gaussian blurring, and
  - (ii) median filtering
- in place of simple averaging. [4 marks]