

3 Introduction to Graphics (rkm38)

- (a) What is the purpose of mapping from scene-referred to display-referred colours? [3 marks]
- (b) How does display encoding differ between standard- and high-dynamic-range displays? [3 marks]
- (c) Explain how simulating glare that happens in the eyes or in a camera can enhance the appearance of rendered scenes. [3 marks]
- (d) Why is glare typically simulated only for the values that exceed the maximum displayable value? [3 marks]
- (e) Write the equation of a function that maps linear input colour channel value  $x$  (arbitrary range) to display-encoded pixel value such that: (i) the linear value  $x_{white}$  is mapped to the peak value of the display; (ii) the resulting pixel value is in the range from 0 to 255; (iii) the colour is display encoded using the gamma of 2.2. [3 marks]
- (f) You are given spectra of two colours:  $c_1(\lambda)$ ,  $c_2(\lambda)$  and cone response functions  $l(\lambda)$ ,  $m(\lambda)$ ,  $s(\lambda)$ . How would you test whether the colours  $c_1$  and  $c_2$  are metamers? Write down the equations for such a test. [5 marks]