

M.TECH PRINTING ENGINEERING AND GRAPHIC COMMUNICATION
FIRST YEAR SECOND SEMESTER 2025
ADVANCED COLORIMETRY
FULL MARKS 100

ANSWER ANY FIVE QUESTIONS

Module 1

1. Give a brief description of Chromatic adaptation transform CAT02. 20
2. a) What is the McCollough effect of chromatic adaptation. b) Describe Fairchild's model of Chromatic adaptation. 5+15 =20

Module 2

- 3.a) Draw Contours of constant hue in the CIE 1931 chromaticity diagram and explain the Abney effect. b) Write the equation of The predictor of chromatic lightness L^{**} clearly mentioning the parameters in helmholtz–kohlrausch effect.

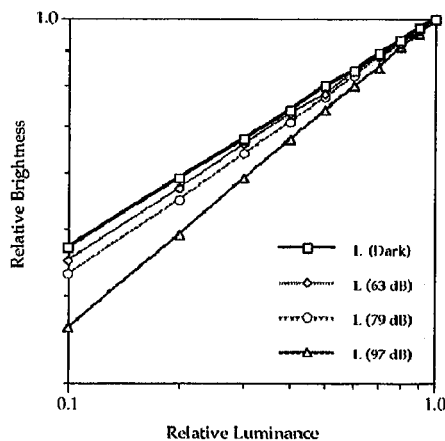


Figure 1

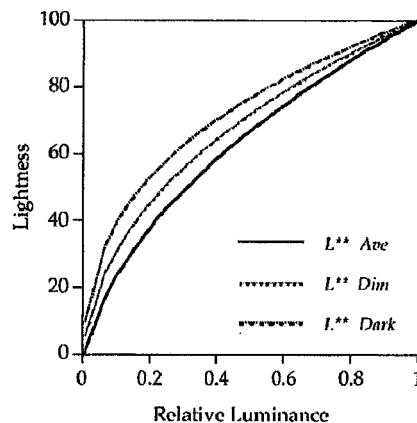


Figure 2

The relative brightness and lightness are varying with relative luminance in Figure 1 and Figure 2.

- c) Mention what are the color appearance phenomena associated with these two figures
- d) Briefly describe the phenomena with the figures given. 5+5+5+5=20

4. a) Compare Shepard's interpolation with Lattice based interpolation used for device characterization. 10

b) Draw the block diagram of digital camera calibration, characterization and chromatic adaptation transforms and describe model based characterization of digital camera. 10

Module 3

5. a) How TOPO algorithm of gamut compression works. b) Describe GCUSP algorithm of gamut mapping proposed by Morovic and Luo. c) Describe one sequential gamut mapping algorithm d) What are the factors affecting gamut mapping algorithms? $5+5+5+5=20$

6. a) What are the steps to optimize various parameters of the Neugobauer model for a CMY printer. b) How direct constraint based CMYK inversion is applied? $10+10=20$

Module 1,2 and 3

7. Differentiate between $4*5=20$

a) Absolute and relative colorimetry b) CIECAM97 and CIECAM02 c) CIE 94 and CIE 2000 color difference equation d) Visual and instrumental color matching e) broadband color measuring instruments and narrow band color measuring instruments

8. Write short notes on: $5*4=20$

a) Hi fidelity color printing b) Whiteness index c) Nayatani's model of chromatic adaptation d) Mountain range method of gamut boundary description