

Manipal Institute of Technology, Manipal

(A Constituent Institute of Manipal University)



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V SEMESTER B.TECH (PRINT AND MEDIA TECHNOLOGY) END SEMESTER EXAMINATIONS, NOV/DEC 2015

SUBJECT: COLOR ANALYSIS AND REPRODUCTION [PME 305]

REVISED CREDIT SYSTEM

Time: 3 Hours

MAX. MARKS: 50

Instructions to Candidates:

- ✤ Answer ANY FIVE FULL questions.
- ✤ Missing data may be suitable assumed.
- Define Color Separation. Explain the three basic processes to accomplish color 3 separation.
- **1B.** How does the "Conversions Work" from source to destination? Explain.
- **1C.** Give reasons for the following statements:
 - i. Brilliant colors have a high level of saturation.
 - ii. Shades are reduced in saturation.
 - iii. Strong tints are sometimes mistaken for saturated colors.
 - iv. Value is associated with the idea of luminosity.
 - v. Value contrast exists whether or not hue is present.
 - vi. High-contrast images are not always desirable.
 - vii. Only occasionally are colors used at full saturation.
 - viii. When you see two or more colors together they have a profound effect on one another.
- 2A. Explain the two techniques used to help improve trapping in the tonal areas of 3 four-color process printing.
- 2B. List the six possibilities and then quote what happens when blue light reaches a magenta object? Explain the Primary and Secondary Colors.
- **2C.** Explain the four basic components of a ICC-based color management system. **4**
- 3A. Define Density and how is it measured by the devices. Explain the four distinct 3 types of transmissive density measurements with neat diagrams.
- **3B.** Explain the practical interpretation of subtractive color mixture with appropriate **3** examples.
- 3C. Define CIE Standard Observer. Define CIE Standard Illuminants A, C, D50 and D65 with their spectral power distributions. What is the difference between an illuminant and a source?

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- 4A. Why use halftone screen angles? Why not just have all the screens at the same angle and be done with it? What is the standard screen angle for printing 4 color process jobs, 2 color and 3 color jobs? Also mention the standard screen angles for jobs when skin color predominates and when light greens predominates.
- **4B.** Write the Three-Color Equation for total blue-light reflectance for a Color **3** scanner output signals. Mention the six basic elements of a scanner.
- 4C. Explain light as an electromagnetic wave theory. Explain how light from any source can be described in terms of the relative power with proper examples.
- 5A. Elaborate on Focoltone. Explain the Negative Color Comparison. Explain the 3 two methods for measuring or comparing printed color with a reference color.
- 5B. Explain the difference in Phasic arousal and Tonic arousal with examples. 3Explain the principle of Metamerism and its variants.
- 5C. Write a short note on Halftones and color. Represent graphically using an 8x8 cell matrix the following Halftones: 0%, 25%, 50%, 75% and 100%. Also represent them with following dot gains: 5% in highlight, 10% in midtone and 15% in shadow areas. (halftone shape is square)
- 6A. Mr.Tom and Mr.Jerry had to reproduce a logo with L*a*b* values 40,60,80 which 3 was unfortunately an out-of-gamut color.

Mr.Tom uses only the Adobe CMM engine and the L*a*b* values for the rendering intents are 41,71,88 for perceptual rendering, 40,72,87 for saturation rendering, 40,70,76 for relative colorimetric rendering and 44,54,72 for absolute colorimetric rendering.

Mr.Jerry uses only the Microsoft CMM engine and the L*a*b* values for the rendering intents are 39,72,87 for perceptual rendering, 40,70,77 for saturation rendering, 40,71,85 for relative colorimetric rendering and 40,68,82 for absolute colorimetric rendering.

Calculate and suggest who amongst Tom and Jerry has a better CMM engine for the given logo. Suggest which of the rendering intent is to be selected. (Show all the calculations on the paper)

- 6B. Define visual perception. Explain the retinal photoreceptors that are active for 3 mesopic vision with neat diagrams.
- 6C. Explain the following factors under critical print characteristics

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- (a) Tone reproduction (b) Solid density
- (c) Dot size measurement (d) Grey balance