Ref no.EX/PRN/PC/B/T/312/2024

B.E. PRINTING ENGINEERING
3RD YR 1ST SEMESTER EXAMINATION,2024
Color Science and Engineering
FULL MARKS-100
TIME-3 Hours

Answer any five questions:
(Each question carry equal marks)

CO1

1. a) What are the steps of digital imaging? b))What are the color reproduction preference of the observer?c) What are the important parameters for encoding? d) Why gray component Replacement is needed for a color separation? e) What are the tonal range of sheetfed offset and digital press? f) Define Simultaneous contrast. g) What are the number of color shades for a 32 bit system? 4+ 6+2+2+2+2+2=20

CO2

2.a) Find out the Lab values of the two colors A and B whose tristimulus values are given in Table 1

Table 1

	X	Y	Z
Color A	51	72	65
Color A	47	65	79
Illuminant	96	100	105

b) Predict the colors A and B. c) Compare the colors in terms of the basic three attributes of the color. d)How chromaticity coordinate is found from tristimulus values? e)What does the dominant wavelength and excitation purity signify? f) Find out dE76 between A and B. g) Find out dE94 between A and B. h) Out of these two color differences, which one is better and why? i) Is the color difference perceptible? 5+2+ 2+ 2+2+2+2 +2+1 =20

CO3

3. A magenta color patch P has its principal solid density 1.06 .a)Find out its halftone density of 75% dot area in Murray Davis Equation. b) Find out its halftone density of a 75% dot area in Yule-Nielson.Equation. c) Find out its halftone density of a 75% dot area in Clapper Yule Equation (n-=1.6)? d) Why the dot areas are different in abovementioned three equations? e) What will be its dot gain for the magenta patch P if its measured (Print) dot area is found to be 90%. f) What are the two types of dot gain? G) What are the reasons of dot gain? 2+2+2+4+2+2+6 =20

CO3

4. The solid density of the single color patches are as follows:

Table2

	Dr	Dg	Db
Cyan	1.21	0.42	0.18
Magenta	0.14	1.28	0.25
Yellow	0.07	0.07	1.10
CMY	1.28	1.40	1.25

a)Is the Additivity rule followed as shown in Table 2. b) Find out the proportionality constants from Table 2 and from that, frame the Masking Equation. c) Find out the red, green and blue density of a patch X having 60% cyan, 70% magenta and 25% yellow from Table 2 using Neugebauer Equation. d) predict the color of patch X as found in question 4c). e)Find out Hue Error and Grayness of Cyan, magenta and yellow colors from table 2.f) What does Hue Error and Grayness signify? 1+ 4+ 6+2+6+1=20

CO4

5. a)Draw the diagram of Color Management System. b) What are the four elements of Color Management System. c)How the profiles of scanner and printer are prepared? d) What are SNAP Process check parameters and what are their weight age factors? 6+ 4+4+6=20

CO2

6.a) Draw a diagram of reflection spectrophotometer and briefly describe how it is used for color measurement. b) What are the two theories of color vision? c) Define Metamerism d)How Metamerism Index is measured? e) How General Color Rendering Index and Special Color Rendering Index are measured? f) How sensation is related to stimulus in Weber's law and Steven's law?

4+ 4+2+2+4+4= 20

CO3

7. Differentiate between: 4*5=20

a) Low key and High Key Image b) Light adaptation and dark adaptation c) Calibration and Characterization d) Perceptual and Saturation Rendering Intent e) 2 degree observer and 10 degree observer

CO1,CO4

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

a) Color Temperature b) Unsharp Masking c) Gamut Mapping d) Kubelka Munk theory of color mixing