B.PRINTING ENGINEERING
3RD YR 1ST SEMESTER EXAMINATION,2019
Color Science and Engineering
FULL MARKS-100
TIME-3 Hours

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

1. a) Draw Maxwell Traingle and spectrum locus. B) Write down the expressions of tristimulus values. b)How chromaticity coordinate is found from tristimulus values?c) How dominant wavelength and excitation purity can be found from spectrum locus? d)What does the dominant wavelength and excitation purity signify? e) What are the two theories of color vision?   5+ 2+2+ 4+2+5=20

2.a) Find out the Lab values of the two colors A and B whose tristimulus values are 46,29,85 and 50,24,91 respectively.(X,Y,Z values of D 65 is given as 95.05, 100 and 108.90 respectively. b) Compare the colors in terms of the basic three attributes of the color.c) Find out dE 76 for the two colors. d) Find out dE94 between A and B.e) Why dE94 is better than dE76 f) What are the limitations of CIE system? g)What do you understand by the Munsell notation of the two colors 4BG 2/10 and 4BG 5/10? h). What will be their color difference? i) Why dE 2000 is better than other color difference)?
                                                    4+2+2 +2+2+2+2+2+2 =20

3.a)Deduce Modified Yule- Nieslson or Clapper Yule equation to find out dot area. b) From that equation, find out the halftone density of a 60% dot area magenta patch having 4% gloss and 64% transmittance. Paper reflectance is 95% and emergence factor is 67%. Assume other data if necessary.   16+4=20

4.a) What are the factors affecting dot gain? b) Why the dot gain gradually reduces from midtone to shadow? c) Deduce Neugebauer equation. d) Find out the red, green and blue density of a patch having 50% cyan, 70% magenta and 55% yellow from Table 1.

The density of the single color patches are3 as follows:

Table1

	Dr	Dg	Db
Cyan	1.01	0.45	0.19
Magenta	0.14	1.25	0.25
Yellow	0.06	0.05	1.15

5+1+10+4=20

5. a)What are the differences between Calibration and Characterization ? b)What are the different types of rendering intents in Color Management System and where are they applied? c)How the profiles of scanner, monitor and printer are prepared? d)How can you assess the profile quality? e)Is color management system essential for all kind of color reproduction?   4+6+ 6+2+2=20

6. a) What are the steps of digital imaging? b) What are the basic steps of sampling? c)What are the color reproduction preference of the observer?   d) What are the tonal range of sheetfed offset and flexo press? e) define tolerance for color reproduction.f) What is gamma?.g) What are the number of color shades for a 64 bit system?

4+ 2 +6+2+2+2+2=20

7. Differentiate between: 4*5=20
a) Munsell and CIE System b) absolute and relative colorimetric rendering intent c) Hue error and grayness d) brightness and lightness e)Transmission density and reflection density

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

   a) Color Temperature b) Histogram of color images c) Gamut Mapping d) Press
       Calibration