V SEMESTER B.TECH. MEDIA TECHNOLOGY
END SEMESTER EXAMINATIONS, NOVEMBER 2022

SUBJECT: COLOR SCIENCE AND TECHNOLOGY [MED3151]

Time: 3 Hours MAX. MARKS: 50

1. What can you deduce from the following statements? 3

   (A) A sensation alone (whether it is a sight, sound, taste, smell, or touch) is an incomplete event.

   (B) Memory color means that the viewer makes an unconscious assumption about the color of something.

2. Sneha and Shreya went on a picnic with their friends. It was late in the evening and they decided to have a camp fire which was burning bright in yellow. Under the camp fire they started to play a game “guess the color”. ***Every individual would pick some item from their bag and hold in their hand which would be illuminated by the yellow camp fire.*** They were having great fun. Every time Sneha took an item, all friends would get the wrong color guess while only Shreya was able to guess the correct color as she had helped Sneha earlier to pack her bags. Analyze the case to identify the phenomenon that helped Shreya identify the correct color despite all her other friends getting it all wrong. Explain and then elaborate on its two variants. 3

3. Appraise on how the two-dimensional diagram failed to give a uniformly-spaced visual representation in 1931 to achieving nearly uniform visual color representation in 1976. 4

4. Elaborate on the difference between an illuminant and a source. Explain color as an event. 3

5. Explain the Negative Color Comparison method used by the Focoltone Intelligent Color Calibration System (ICCS) 3

6. Sneha and Shreya go shopping with their mom. After a whole evening of window shopping, mom finally likes a dress which has the L*a*b* value of 55,-65,50. After their mom purchased the dress, both Sneha and Shreya decide to buy their dresses identical COLOR to their mom. 4

   While in SHOP A, Sneha shortlisted two dresses with L*a*b* values for DRESS#1 57,-67,54 and DRESS#2 56,-63,51 and Shreya too picked two dresses with L*a*b* values for DRESS#1 57,-68,49 and DRESS#2 56,-67,54.

   They also tried a second SHOP B, where Sneha picked two more dresses with L*a*b* values for DRESS#1 56,-67,53 and DRESS#2 53,-69,51, Shreya was not left behind with her two choices with L*a*b* values for DRESS#1 54,-64,49 and DRESS#2 56,-66,47.

   It was a great shopping streak and they returned back home. From the above data can you comment on:

(A) Who among Sneha and Shreya has picked a dress which is closest to their mother's dress.
(B) Which is the best dress picked by Sneha which is closest to her mom's dress?
(C) Which is the best dress picked by Shreya which is closest to her mom's dress?
Show all calculations in your answer.

7.	Explain the four basic components of color management systems. Explain the four different methods for handling out-of-gamut colors.	3
8.	Identify the three limitations pertaining to color reproduction, elaborate on its significance.	3
9.	What are Device Profiles? What information does a profile carry? Explain the three limitations in the process of creating profiles. What is the significance of generic profiles?	4
10.	How does using screen angles help to avoid the moiré, explain the concept around this? Bring out the difference between dot-centered rosette and clear-centered rosettes.	3
11.	If the printer resolution is 1080dpi and the image resolution is 135lpi, calculate the required halftone cell matrix to represent graphically the following halftones: 10%, 25%, 60%, 85% and 90%. Also represent the midtones with dot gain of 10%. Assume halftone shape is square. In addition, calculate the number of possible gray levels attainable for this halftone matrix.	3
12.	"A high percentage of trap requires the right balance of three factors: Tack, Absorption, and Time." Explain with details.	4
13.	***"****The color and transparency of printing inks is defined. definitions of paper types to be used is provided. Attainable solid tones, which are described with CIELAB values are mentioned. tone value increases (TVI), per paper type and color is also provided here.****"***. From the given statements, identify what type of standard that is addressed. Write a short note on the same. Shed some light on benefits to the company and customer of using standards.	3
14.	Elaborate on the procedure used to test Gray Balance with neat illustrations.	3
15.	Explain the significance of relationship between ink film thickness, reflectance and the density. How can we incorporate the Beer's Law in understanding the relationship between IFT and Color? Elaborate.	4