20181CSE0621
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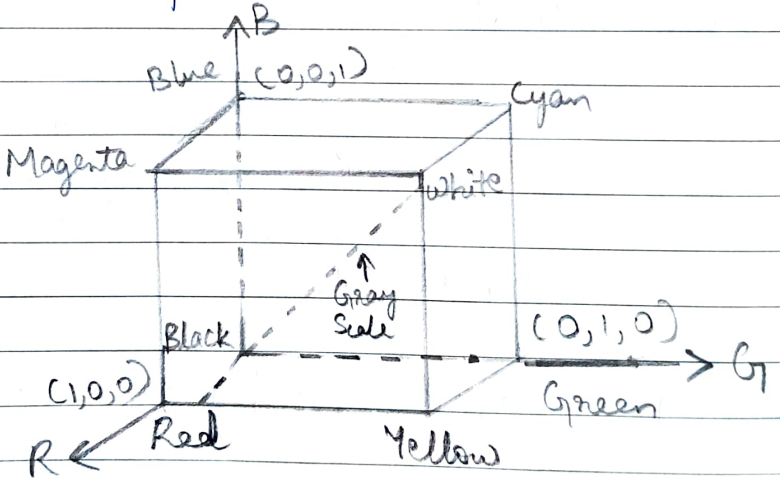
Part-C

Q.1 → RGB Color Model:

- The RGB color model has red, blue and green colors that are added together in various proportions to produce an extensive range of colors
- The purpose of color models is to facilitate the specification of colors in some standard.
- The RGB model has the following components:-

R → 8 bits
G → 8 bits
B → 8 bits
} color depth = 24 bits and 16777216 colors

- Geometric Representation:



→ HSI Color Model:

- HSI stands for Hue, Saturation and Intensity.
- In this model Hue describes the color in the form of an angle between 0° and 360°. The Saturation shows how much the image color is polluted with white color, the intensity range is 0 to 1 (0 means black & 1 means white).

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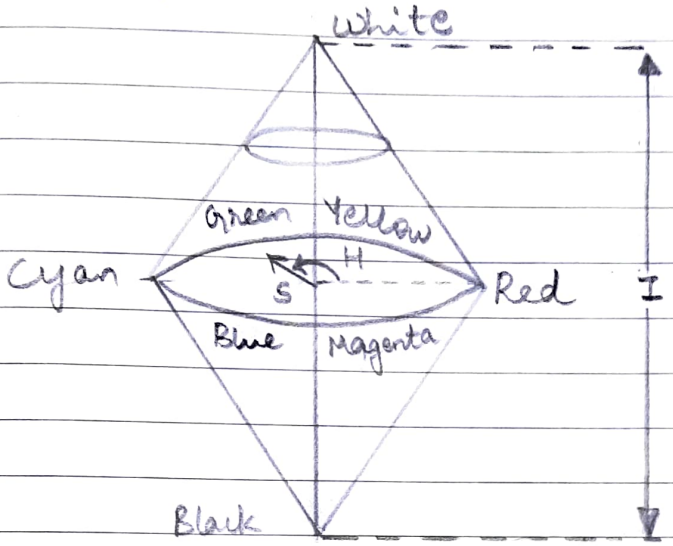
In HSI model the parameters depict:
Hue : Dominant Color
Saturation : Relative Purity
Intensity : Brightness
} color carrying information

Geometric Representation:



→ Given, $H = 30^\circ$ and 255°

$S = 0.80$; $I = 0.70$

$H = 30^\circ$, $0 \le H < 120$

$$\therefore R = I\left[1 + \frac{S\cos H}{\cos(60-H)}\right] = 0.7\left[1 + \frac{0.8\cos(30)}{\cos 30}\right] = 1.26$$

$$B = I(1-S) = 0.7(1-0.8) = 0.14$$

$$G = 1-(R+B) = 1-(1.26+0.14) = -0.40$$

$H = 255^\circ$, $240 \le H \le 360^\circ$

$H = H - 240 = 15$

$$B = I\left[1 + \frac{S\cos H}{\cos(60-H)}\right] = 0.7\left[1 + \frac{0.8\cos 15}{\cos 45}\right] = 1.465$$

$$G = I(1-S) = 0.7(1-0.8) = 0.14$$

$$R = 1-(G+B) = -0.605$$

$\therefore$ ~~For $H = 30^\circ$, RGB = (1.26, 0.14, -0.40)~~

$H = 255^\circ$, RGB = (1.465

For $H = 30$, RGB = (1.26, -0.40, 0.14)

$H = 255^\circ$, RGB = (-0.605, 0.14, 1.465)