Quiz for webminar 2

March 27, 2017

1- Candela is the unit for which of the following photometric quantities?

   a. Luminous flux
   b. Luminous intensity
   c. Illuminance
   d. Luminance

2- An optical source of luminous flux of 5 lumens shines its light in a cone of 2 sr. The cone intersects a $10m^2$ area on a wall nearby. What is the luminous intensity of the source and the illuminance on the wall respectively?
   a. 2 lux, 10 candela
   b. 2 candela, 10 lux
   c. 2.5 candela, 0.5 lux
   d. 0.5 lux, 2.5 candela

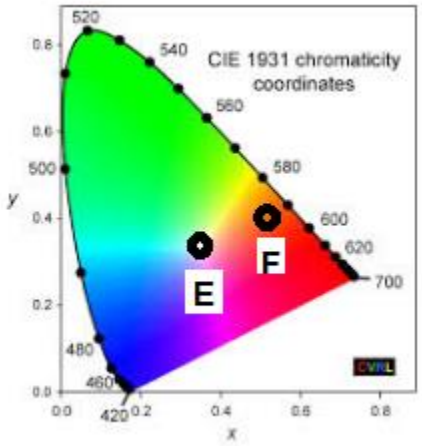
3- What is the radiance and luminance of a source of light if it subtends a 0.2 sr solid angle, has 2 watts of power emitting from a 0.01 m^2 area and its wavelength is 555 nm? PS: One watt of light at 555 nm corresponds to 683 lumens.
a. 40 watts/m^2/sr, 273 candela/m^2
b. 2 watts/m^2/sr, 1366 candela/m^2
c. 0.1 watts/m^2/sr, 68 candela/m^2
d. 1000 watts/m^2/sr, 1,366,000 candela/m^2

4- A cone of light subtends a circular area of radius 1 m on a nearby screen located at a 10 m distance. What is the solid angle of this cone?
   a. $\pi/100$
   b. $\pi^2/100$
   c. $2\pi/100$
   d. $\pi/10$

5- If the first two CIE chromaticity coordinates are given by x=0.2 and y=0.6, what is the value of the third chromaticity coordinate z?

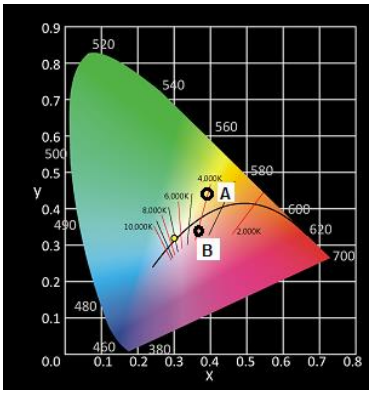
a. 0.8
b. 0.3
c. 0.2
d. 0.4

6- Referring to the following CIE 1931 chromaticity diagram, where E is the reference source and F is the test source, what is the most likely <u>dominant wavelength</u> for the test source?



a. 550 nm
b. 580 nm
c. 590 nm
d. 600 nm

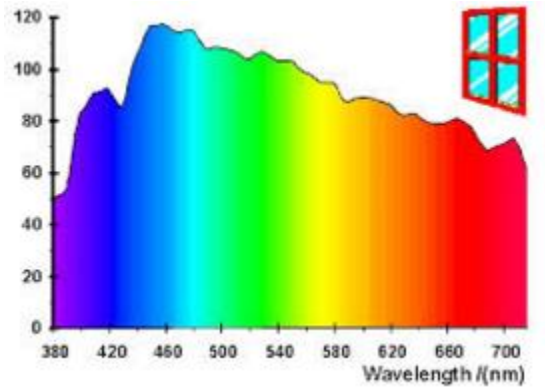
7- Two sources A and B (represented by black circles) lie on the opposite sides of the Planckian locus as shown in the figure. Which statement is correct about these two sources?



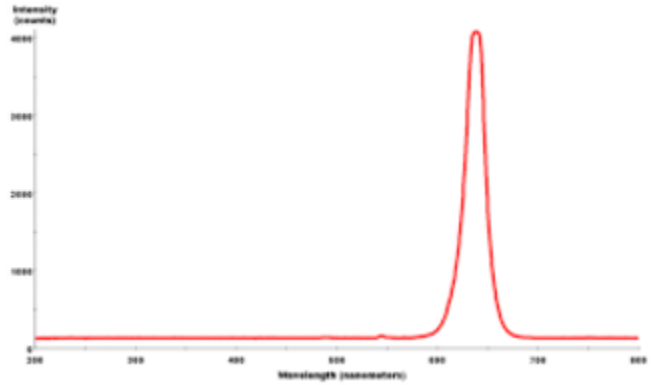
a. Both A and B are blackbodies.
b. The correlated color temperature (CCT) of A is more than B.
c. Both A and B have the same CCT
d. The CCT of B is more than B

8- Which of the following sources does not have a CCT?

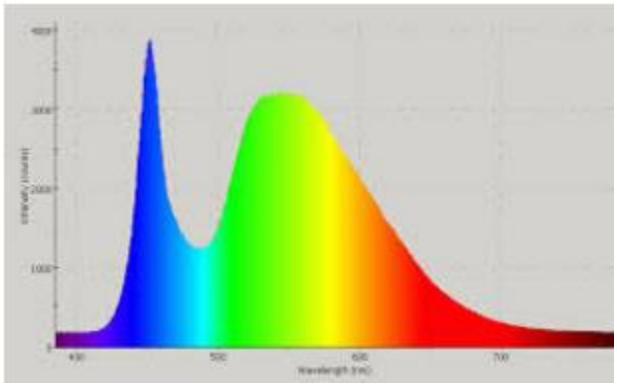
a. Daylight



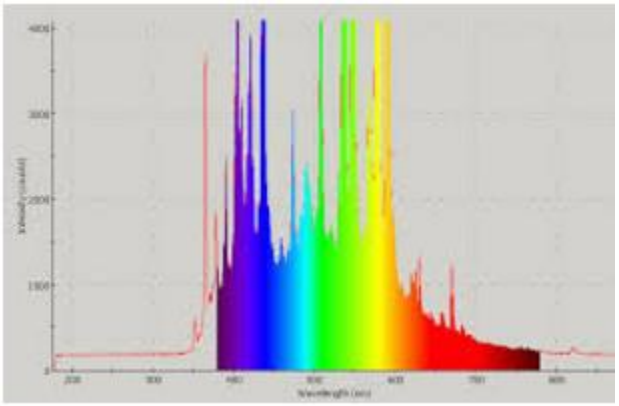
b. Red LED



c. Cool white LED



d. HID lamp



9- Which of the following steps is not necessary in the procedure to calculate the average CRI?

a. Calculation of CCT
b. Choosing a reference source with the same CCT
c. Illuminating several surfaces of different colors with the reference and test sources.
d. Calculating the dominant wavelength.

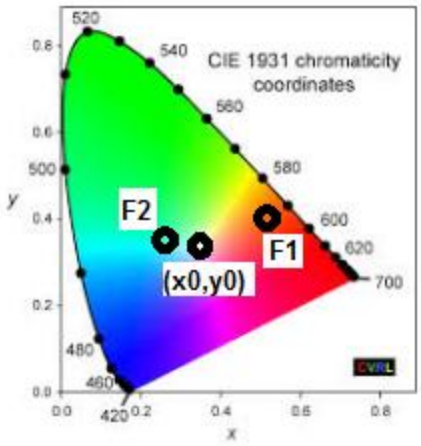
10- An automobile headlamp (high beam) is most likely to have which iof the following candela levels?

a. 300,000 candelas
b. 1000,000 candelas
c. 100,000 candelas
d. 150 candelas

11- Purity as defined by CIE 1931 x,y chromaticity coordinates is defined as

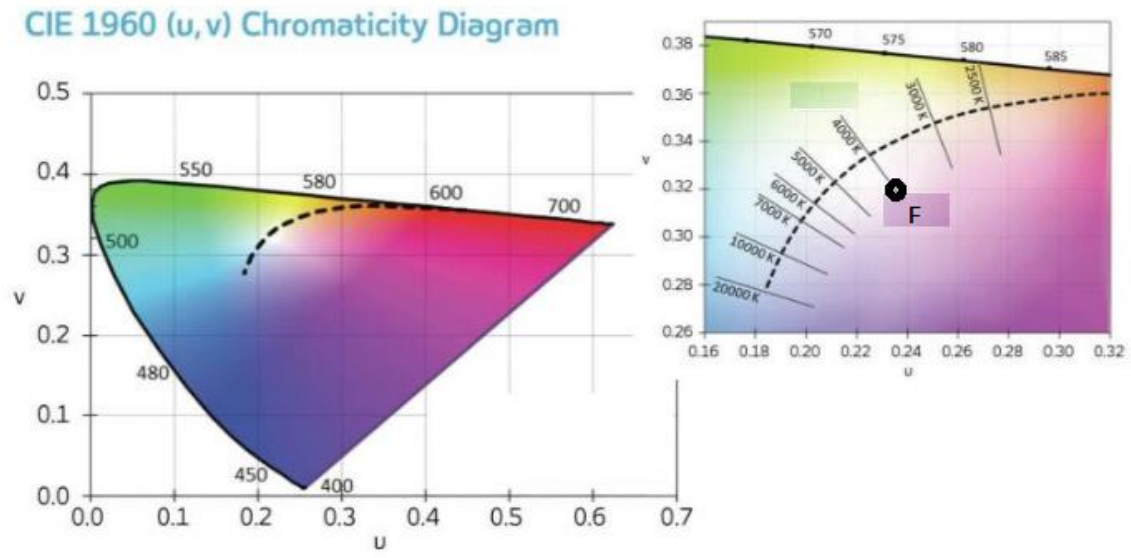
$$P_e = \frac{y_f - y_0}{y_d - y_0} = \frac{x_f - x_0}{x_d - x_0}$$

Where the suffix 0 indicates the white reference point, F is the test source and d is the dominant wavelength. Based on this definition, which of the following test sources, F1 and F2 have a higher purity?



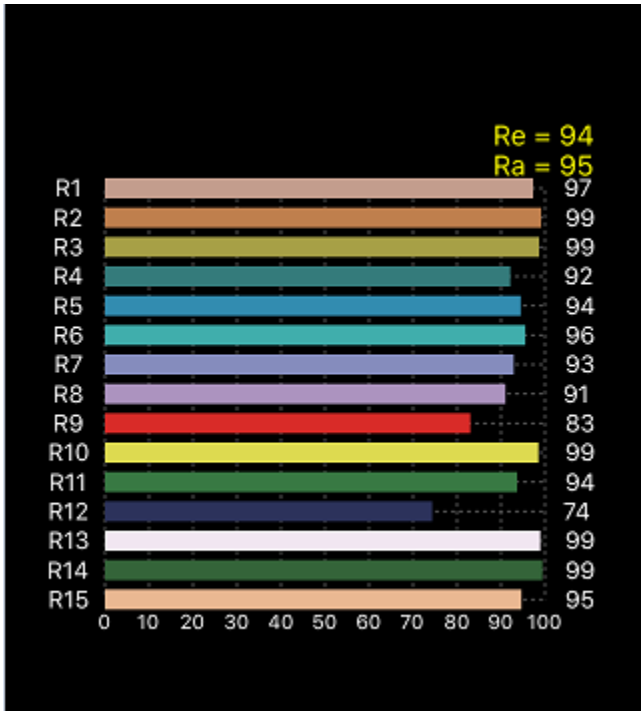
a. F1
b. F2
c. Purity is the same for both sources
d. Purity is not defined for F2

12- In the following 1960 chromaticity diagram, what is the most likely Duv of the source F?



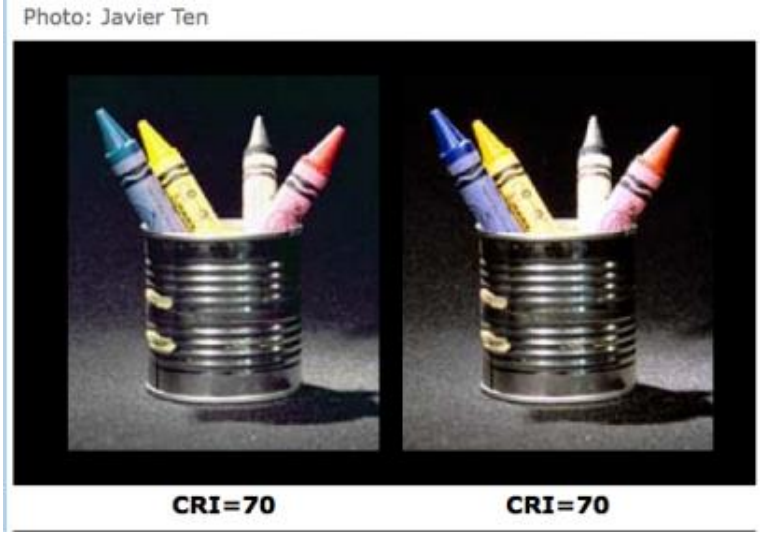
a. +0.02
b. +0.01
c. -0.01
d. -0.02

13- By referring to the following diagram, indicate which of the following statements is NOT correct?



a. The color rendition of dark blue is poorest as compared to other colors.
b. The average of R1 to R8 is 95
c. The average of R1 to R 15 is 94
d. Color rendition Index (CRI) is 94

14- Two light bulbs have exactly the same CRI index of 70 as shown in the figure but produce different rendering of blue color (The blue in the left picture is more pronounced). What is the most UNLIKELY reason for this effect?



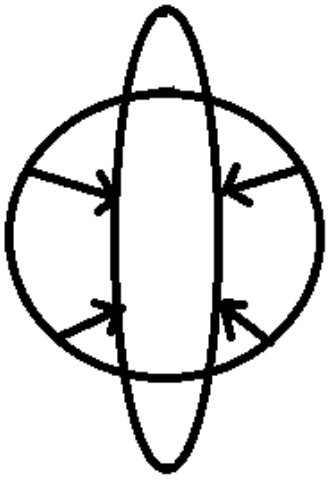
a. The calculation of CRI is incorrect
b. CRI is an average value
c. There are several peaks at different wavelength in the spectra of these sources
d. Some colors are rendered better than others

15- What are the limitations of CRI?
a. It is based only on fidelity
b. Small sample set
c. Loss of info due to averaging
d. All of the above

16- What is the most likely flicker frequency for a florescent light?
a. 60 Hz
b. 120 Hz
c. 100 Hz
d. 1 Hz

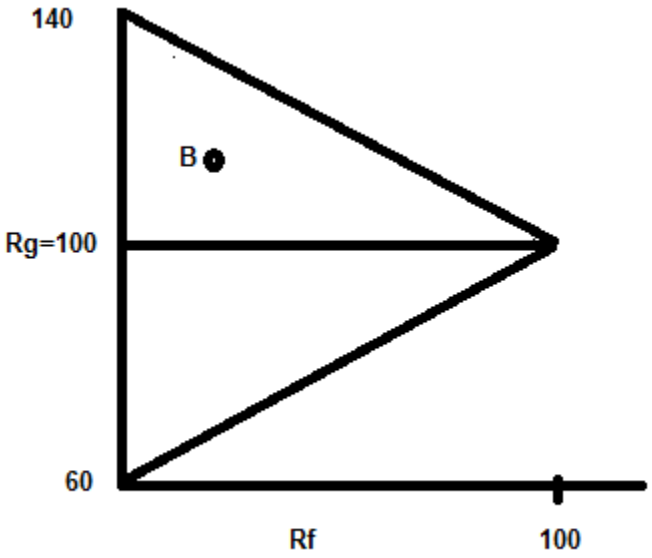
17- What are the advantages of IES-TN-30-15?
a. 99 color samples
b. Fidelity and Color indices
c. Graphical representations of shifts
d. All of the above

18- What do the arrows in the following graphical representation show in TM-30-15 standard?

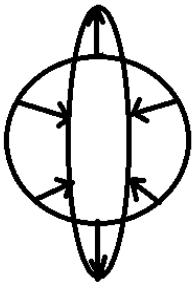


a. Decreased saturation
b. Increased saturation
c. Increased hue
d. Decreased hue

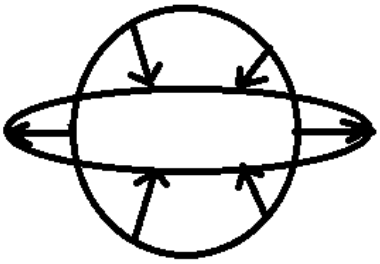
19- Which vector graph most likely corresponds to the above TM30-15 R_g-R_f graph?



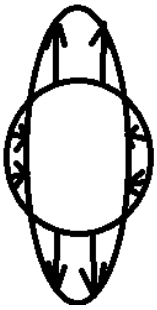
a. Below



b. Below

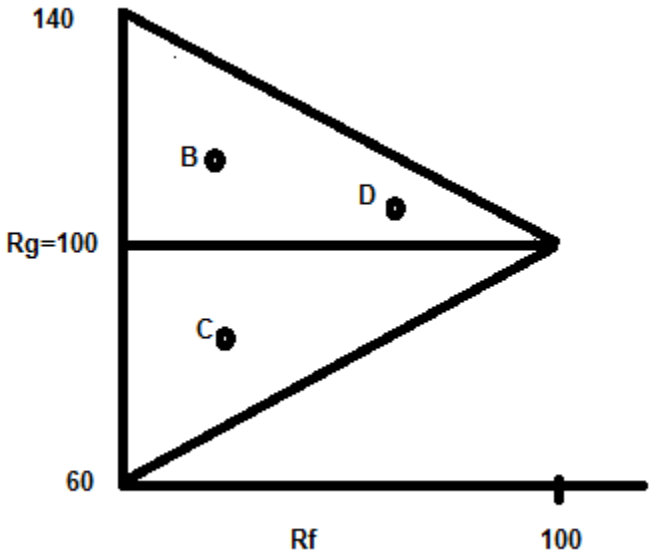


c. Below



d. None of the above

20- Which source has more saturated colors according to this Tm_30-15 diagram?



a. B
b. C
c. D
d. B and C equally