Test 1: Example #2

Note: * indicates the correct answer.

1. A red shirt illuminated with yellow light will appear
   (a) orange
   (b) green
   (c) blue
   (d) yellow
   * (e) red

2. Color TV is an example of color mixing by
   (a) neither of these
   (b) X
   * (c) addition
   (d) subtraction
   (e) X

3. When a tungsten-filament lamp is dimmed with a dimmer (which reduces the current flowing through the filament), there is a shift in the peak of the spectrum of the lamp toward a
   * (a) longer wavelength
   (b) no change
   (c) X
   (d) X
   (e) shorter wavelength

4. In the case directly above, the total energy emitted is
   * (a) decreased
   (b) increased
   (c) X
   (d) X
   (e) not changed
5. When a tungsten-filament lamp is dimmed using a lamp shade, there is a shift in the peak of the spectrum of the lamp toward a
   (a) longer wavelength
   (b) no change
   * (c) depends on color of lamp shade
   (d) shorter wavelength
   (e) X

6. Complementary colors are
   * (a) two colors which added together give white light.
     (b) none of these.
     (c) the same as primary colors.
     (d) two colors which go together.
     (e) two colors which enhance each other.

7. Which of the following is not an additive primary color?
   * (a) yellow
     (b) none of these
     (c) green
     (d) blue
     (e) red

8. A pigment that absorbs red light from white light appears to be
   * (a) cyan
     (b) magenta
     (c) violet
     (d) yellow
     (e) blue

9. A red filter and a blue filter on top of each other are placed in the white-light beam from a slide projector.
   (a) The screen will be illuminated with yellow light.
   (b) The screen will be illuminated with purple light.
   (c) The screen will be illuminated with white light.
   (d) The screen will be illuminated with green light.
   * (e) Very little light will strike the screen.
10. If a red filter is placed in one slide projector and a cyan filter is placed in another, and both are focused onto the same screen such that they overlap, in the overlapping region the screen will appear to be illuminated by:

(a) yellow light
* (b) white light
(c) blue light
(d) magenta light
(e) no light

11. The tristimulus values of a certain spectrum are found experimentally to be: X = 30, Y = 60, and Z = 10. The chromaticity coordinates (x,y) of this spectrum are:

(a) none of these
(b) 0.10, 0.60
(c) 0.60, 0.10
(d) 0.30, 0.10
* (e) 0.30, 0.60

12. The following four questions can be answered by referring to the attached chromaticity diagram. Plot, on the diagram, a point for which the x chromaticity is 0.20 and the y chromaticity is 0.30. The dominant wavelength of this light spectrum, in nanometers, is approximately:

(a) none of these
(b) 640
(c) 488
(d) 596
(e) 533
13. The approximate dominant wavelength of the complementary color is:
   (a) none of these
   (b) 640
   (c) 596
   (d) 488
   (e) 533

14. The purity (saturation) of the color is approximately:
   (a) 0.57  (b) 0.74  (c) none of these  (d) 0.43  (e) 0.13

15. Which words describe this chromaticity (use Plate 8 in the book):
   (a) light blue
   (b) fire engine red
   (c) deep purple
   (d) infrared
   (e) sunny yellow

16. What is the luminous flux of this light?
   * (a) can't tell from this information
   (b) 0.50 lumens
   (c) 1.0 lumens
   (d) 0.30 lumens
   (e) 0.20 lumens

17. When the three (subtractive) primary pigments are mixed in proper proportions all the colors are subtracted, resulting in
   (a) violet
   * (b) black
   (c) purple
   (d) white
   (e) magenta

18. If indoor photographic film is incorrectly used outdoors, then the resulting color pictures will appear
   (a) too reddish
   (b) too small
   (c) out of focus
   (d) okay
19. If outdoor photographic film is incorrectly used indoors, then the resulting color pictures will appear
   (a) too small
   (b) out of focus
   (c) too bluish
   * (d) too reddish
   (e) okay

20. Which combination of printers inks on white paper will most closely reproduce orange (made of the additive colors red and a little green)?
   (a) magenta & yellow
   (b) yellow & a little magenta
   (c) a little magenta & a little yellow
   (d) yellow, a little magenta, & a little cyan
   (e) use no ink

21. Which combination of printers inks on white paper will most closely reproduce red?
   (a) a little magenta & a little yellow
   (b) use no ink
   * (c) magenta & yellow
   (d) yellow, a little magenta, & a little cyan
   (e) yellow & a little magenta

22. Which combination of printers inks on white paper will most closely reproduce brown (a little red & a little green, i.e. dark yellow)?
   (a) a little magenta & a little yellow
   (b) use no ink
   (c) magenta & yellow
   (d) yellow & a little magenta
   (e) yellow, a little magenta, & a little cyan

23. Which combination of printers inks on white paper will most closely reproduce pink (red, a little green and a little blue)?
   (a) yellow, a little magenta, and a little cyan
   (b) yellow and a little magenta
   (c) a little magenta and a little yellow
   (d) use no ink
(e) magenta and yellow
24. Which combination of printers inks on white paper will most closely reproduce white?
   (a) yellow, a little magenta, and a little cyan
   (b) magenta and yellow
   (c) a little magenta and a little yellow
   * (d) use no ink
   (e) yellow and a little magenta

25. Which one of these is correct for subtractive color mixing as in dyes or inks?
   (a) red plus cyan produces magenta
   (b) red plus green produces yellow
   (c) magenta plus cyan produces yellow
   * (d) red plus cyan produces black
   (e) yellow plus cyan produces magenta

26. An unknown light source shines through two known filters placed side by side. Through a
    magenta filter the light appears red, and through a yellow filter the light appears yellow. The
    light itself is probably
   (a) red
   (b) green
   (c) cyan
   (d) blue
   * (e) yellow

27. The speed of sound in air is about 1000 feet/second. The wavelength of a sound of frequency
    250 hertz will be
   * (a) 4 feet
   (b) 0.25 feet
   (c) 8 feet
   (d) none of these
   (e) 250 feet

28. Light of intensity $I$ is incident on a fairly thick glass plate. The reflected intensity is $I(R)$ ; the
    intensity of light absorbed in the glass is $I(A)$. The intensity $I(T)$ of the light transmitted through
    the glass plate is
   * (a) $I - I(R) - I(A)$
   (b) $I(R) + I(A)$
   (c) $I - I(R) + I(A)$
   (d) $I - I(R)$
(e) $I + I(R) - I(A)$
29. Which one of the following statements about photons is correct?
   (a) The color of a beam is determined by the number of photons present in the beam.
   (b) The wavelength of each photon determines the brightness of the beam.
   (c) The brightness of a beam is determined by the energy of the individual photons of which
   the beam is composed.
   * (d) The color of a beam of light is determined by the energy of the individual photons of
   which the beam is composed.
   (e) None of these.

30. Light is shown to be a *transverse* wave motion by experiments involving
   (a) Diffraction
   (b) Interference
   * (c) Polarization
   (d) Reflection
   (e) Refraction

31. The fluorescence of some materials under ultraviolet light enables one to see objects brightly
    colored when illuminated by “black light”. The fluorescence is the result of
   (a) None of these
   (b) The selective absorption by the pigments of all but the pigment colors
   * (c) The conversion of the short wavelength light into light of visible wavelength
   (d) The rotation of the plane of polarization of ultraviolet light more than for other colors
   (e) The scattering of ultraviolet away from the eye, leaving light reflected in the true
       pigment colors

32. A beam of magenta light strikes a cyan filter. The color transmitted by the filter is
   (a) green
   (b) cyan
   (c) red
   * (d) blue
   (e) magenta
33. The wavelength of which of these colors is closest to that of blue?
   (a) orange
   (b) yellow
   * (c) green
   (d) black
   (e) red

34. The term brightness refers to
   (a) the saturation
   (b) the relative amount of white light
   (c) the hue
   (d) the spectral composition of the color
   * (e) the quantity of light present

35. The term saturation is a measure of
   (a) the relative amount of pure color and white light in the sample
   * (b) the intensity of the light
   (c) the actual color
   (d) the luminance
   (e) none of the above

36. The term hue refers to
   * (a) the dominant wavelength of light
   (b) the relative amounts of color and white light
   (c) none of these
   (d) the polarization of the light
   (e) the amount of light

37. Three numbers are needed to completely specify a color.
   (a) X
   (b) X
   (c) false
   * (d) true
   (e) X
38. The type of light one uses for viewing does not affect the appearance of a colored surface.
   * (a) false
   (b) true
   (c) X
   (d) X
   (e) X

39. If blue light is subtracted from dispersed white light, the remaining colors will combine to form yellow light.
   * (a) true
   (b) X
   (c) X
   (d) false
   (e) X

40. An object described as black reflects all colors of light incident on it.
   * (a) false
   (b) X
   (c) true
   (d) X
   (e) X

41. A green glass filter will subtract green light from white light and transmit the rest of the colors.
   (a) X
   (b) X
   (c) true
   (d) X
   * (e) false

42. The subtractive primaries are yellow, blue, and green.
   (a) X
   (b) X
   (c) true
   (d) X
   * (e) false
43. A blue photon has more energy than a red photon.
   (a) false
   (b) X
   (c) X
   * (d) true
   (e) X

44. Two colors are called metamers if they produce the same perceived color, although their spectral compositions may be quite different.
   (a) false
   * (b) true
   (c) X
   (d) X
   (e) X

45. Purples are not spectral colors, but their hues can be specified in terms of their (green) complementary colors.
   (a) X
   (b) X
   (c) false
   * (d) true
   (e) X

46. The "greenhouse effect" occurs because window glass transmits visible light much better than infrared.
   (a) X
   (b) X
   * (c) true
   (d) false
   (e) X

47. Increasing the concentration of a colorant can change its purity or saturation, but cannot change its hue.
   * (a) true
   (b) X
   (c) false
   (d) X
   (e) X
48. Normal humans can easily distinguish slight variations in the spectra of light sources.
   (a) X
   (b) false
   * (c) true
   (d) X
   (e) X

49. Light from the sun has more relative intensity in the infrared than light from an incandescent bulb.
   (a) X
   (b) X
   (c) true
   (d) X
   * (e) false

50. Almost all of the electromagnetic spectrum is visible.
   (a) X
   (b) X
   * (c) false
   (d) X
   (e) true

51. Because sodium-vapor lamps are more efficient than tungsten-filament lamps (that is, they give more light per watt of electricity consumed), they are favored for lighting interiors such as homes and offices.
   (a) X
   * (b) false
   (c) X
   (d) X
   (e) true

52. Our belief in the straight-line propagation of light is of great practical, day-to-day importance to us.
   (a) X
   (b) X
   (c) X
   * (d) true
   (e) false