

**Out Of Sight - B Division National Science Olympiad****Multiple Choice**

*Identify the choice that best completes the statement or answers the question. WRITE YOUR LETTER ANSWER CLEARLY - USE BLOCK LETTERS LIKE THIS SENTENCE. GOOD LUCK.*

- \_\_\_\_\_ 1. Electromagnetic waves are  
A transverse waves.  
B longitudinal waves.
- \_\_\_\_\_ 2. Electromagnetic waves  
A need a medium to travel through.  
B can travel through a vacuum.
- \_\_\_\_\_ 3. Which of these electromagnetic waves has the shortest wavelength?  
A Infrared waves  
B Light waves  
C Radio waves  
D X-rays  
E Ultraviolet waves
- \_\_\_\_\_ 4. Compared to the velocity of radio waves, the velocity of visible light waves is  
A slower.  
B faster.  
C the same.
- \_\_\_\_\_ 5. Heat lamps give off mostly  
A X-rays.  
B infrared waves.  
C ultraviolet waves.  
D microwaves.  
E radio waves.
- \_\_\_\_\_ 6. What is the wavelength of an electromagnetic wave that has a frequency of 1 Hz?  
A More than 1 m  
B Less than 1 m  
C 1 m
- \_\_\_\_\_ 7. The color of an object we see is determined by the  
A colors of light reflected by the object.  
B frequencies of light absorbed by the object.  
C colors of light shining on the object.  
D frequencies of light reflected by the object.  
E all of the above
- \_\_\_\_\_ 8. Humans are most sensitive to light that is  
A red.  
B white.  
C black.  
D yellow-green.  
E green-blue.

- \_\_\_\_\_ 9. Different colors of light correspond to different light
- A frequencies.
  - B polarities.
  - C intensities.
  - D velocities.
  - E none of the above
- \_\_\_\_\_ 10. Complementary colors are two colors that
- A are next to each other on the color chart.
  - B produce white light when added together.
  - C look good together.
  - D are primary colors.
  - E none of the above
- \_\_\_\_\_ 11. The three paint colors that are useful for color subtraction are
- A magenta, cyan, and red.
  - B red, blue, and yellow.
  - C magenta, green, and yellow.
  - D red, green, and blue.
  - E magenta, cyan, and yellow.
- \_\_\_\_\_ 12. A sheet of red paper will look black when illuminated with
- A cyan light.
  - B yellow light.
  - C red light.
  - D magenta light.
  - E none of the above
- \_\_\_\_\_ 13. If sunlight were green instead of white, the most comfortable color to wear on a hot day would be
- A yellow.
  - B blue.
  - C green.
  - D magenta.
  - E none of the above
- \_\_\_\_\_ 14. When a sample of an element is heated until it glows, the color it gives off is
- A a continuous band of color.
  - B a composite of many frequencies of light.
  - C a single frequency of light.
- \_\_\_\_\_ 15. The three primary colors of light for additive color mixing are\_\_\_\_\_.
- A red, green, and blue.
  - B yellow, green, and blue.
  - C red, yellow, and blue.
  - D red, yellow, and green.
  - E yellow, cyan, and red.

- \_\_\_\_\_ 16. When red and green light shine on a white sheet, the resulting color is
- A blue.
  - B green.
  - C yellow.
  - D magenta.
  - E cyan.
- \_\_\_\_\_ 17. The law of reflection says that
- A the angle of reflection from a mirror equals the angle of incidence.
  - B waves incident on a mirror are partially reflected.
  - C all waves incident on a mirror are reflected.
  - D the angle a ray is reflected from a mirror is random.
- \_\_\_\_\_ 18. When a virtual image is created in a plane mirror
- A the image is upright.
  - B the image is located behind the mirror.
  - C reflected rays diverge.
  - D all of the above
  - E none of the above
- \_\_\_\_\_ 19. Refraction is caused by
- A different wave speeds.
  - B more than one reflection.
  - C displaced images.
  - D bending.
- \_\_\_\_\_ 20. A penny lies in the bottom of a tea cup filled with water. As you look down on the penny, compared to its actual depth, it looks
- A closer.
  - B farther away.
  - C at the same depth.
- \_\_\_\_\_ 21. When you see a "wet spot" mirage on the road in front of you, you are most likely seeing
- A water.
  - B hot air.
  - C a figment of your imagination.
  - D sky.
  - E none of the above
- \_\_\_\_\_ 22. A beam of light emerges from water into air at an angle. The beam is bent
- A away from the normal.
  - B not at all.
  - C 48 degrees upward.
  - D 96 degrees upward.
  - E towards the normal.
- \_\_\_\_\_ 23. The spectrum produced by a prism or a raindrop is evidence that the average speed of light in the material depends on the light's
- A transmission qualities.
  - B color.
  - C wave nature.
  - D particle nature.

- \_\_\_\_\_ 24. The shortest plane mirror in which you can see your entire image
- A is half your height.
  - B is twice your height.
  - C is equal to your height.
  - D cannot be determined.
  - E depends on how far the mirror is from you.
- \_\_\_\_\_ 25. A converging lens
- A converges parallel rays of light.
  - B refracts parallel rays of light.
  - C is thicker in the center than at the edges.
  - D bends parallel rays of light so they cross at a single point.
  - E all of the above
- \_\_\_\_\_ 26. An image formed by a single diverging lens
- A is upside down.
  - B can be projected on a wall.
  - C is virtual.
  - D is larger than the object.
  - E all of the above
- \_\_\_\_\_ 27. A magnifying glass is a
- A diverging lens.
  - B combination of diverging and converging lenses.
  - C converging lens.
- \_\_\_\_\_ 28. If an object is located between the focal point and a converging lens, the image will be
- A larger than the object.
  - B real.
  - C upside down.
  - D all of the above
  - E none of the above
- \_\_\_\_\_ 29. Which instrument is a human eye most similar to?
- A telescope
  - B microscope
  - C movie projector
  - D camera
- \_\_\_\_\_ 30. On a bright day, the iris of the eye changes so the pupil
- A stays the same as always.
  - B becomes larger.
  - C becomes smaller.

**Out Of Sight - B Division National Science Olympiad  
Answer Section**

**MULTIPLE CHOICE**

1. A
2. B
3. D
4. C
5. B
6. A
7. E
8. D
9. A
10. B
11. E
12. A
13. C
14. B
15. A
16. C
17. A
18. D
19. A
20. A
21. D
22. A
23. B
24. A
25. E
26. C
27. C
28. A
29. D
30. C