SECOND PRE-PERIODIC TEST IN SCIENCE 10

MULTIPLE CHOICE: Choose the LETTER of the correct answer.

1. Which mirror reflects incident light rays and spreads them outwards from a focus?
   A. concave mirror
   B. converging mirror
   C. convex mirror
   D. plane mirror

2. The image in a convex mirror is always _____.
   A. real, inverted and reduced
   B. real, erect and enlarged
   C virtual, erect and reduced.
   virtual, inverted and enlarged

3. What happens to light as it passes through a concave lens?
   A. It converges (comes together)
   B. It diverges (spreads apart)
   C. It remains unchanged
   D. It disappears

4. Which lens always produces a virtual and upright image?
   A. Convex lens
   B. Concave lens
   C. Plane mirror
   D. Prism

5. What is the characteristic of a convex lens?
   A. Thinner in the middle
   B. Thicker in the middle
   C. Flat surface
   D. Curved edges

6. Which type of lens produces an image that is always virtual, reduced in size, and upright formed on the same side where the object is?
   A. The convex lens is also known as a diverging lens.
   B. Concave lens, also known as diverging lens.
   C. Convex lens that is also known as converging lens.
   D. Concave lens, also known as converging lens.

7. For a concave lens, the image formed is always:
   A. Real and inverted
   B. Virtual, erect, and diminished
   C. Real, magnified, and upright
   D. None of the above

8. In a compound microscope, what is the purpose of the objective lens?
   A. To produce a virtual image
   B. To magnify the specimen
   C. To collect and focus light from the specimen
   D. To project the image onto a screen

9. Which optical instrument is specifically designed to magnify and bring closer distant objects, making them visible to the human eye?
   A. camera
   B. microscope
   C. periscope
   D. telescope

10. What is the primary function of the objective lens in a refracting telescope?
    A. To magnify distant objects
    B. To collect and focus light from distant objects
    C. To produce a virtual image
    D. To reduce chromatic aberration

11. What is the primary principle behind the working of a simple electric motor?
    A. Electromagnetic induction
    B. Electrostatic attraction
    C. Electromagnetic interaction between magnetic fields and current-carrying coils
    D. Thermal expansion

12. Which of the following statements is CORRECT?
    A. Short wavelength X-rays are hard X-rays that can penetrate the flesh but not the bones.
    B. Long wavelength X-rays are the hard X-rays that can penetrate metals usually used in industries.
    C. Long wavelength X-rays are the soft X-rays that can penetrate the flesh but not the bones.
    D. Short wavelength X-rays are the soft X-rays that can penetrate metals usually used in industries.

13. Which does NOT belong to the group where all use the same type of electromagnetic wave?
    A. metal cracks detection
    B. treating cancer through the process called radiotherapy
    C. sterilization of water in drinking fountains
    D. food irradiation

14. Why are gamma rays more dangerous to humans than visible light?
    A. Gamma rays have higher frequency range than the visible light.
    B. Gamma rays have higher frequency and energy range than the visible light.
    C. Gamma rays are the shortest-wavelength, highest frequency and energy electromagnetic waves.
    D. Gamma rays are shorter waves, have higher frequency and energy for its penetrating ability than the visible light.

15. Which type of radiation is used in cancer treatments?
    A. low-frequency non-ionizing UV rays
    B. long wavelength non-ionizing radio waves
    C. highly energetic ionizing gamma rays
    D. flesh-penetrating ionizing X-rays

16. Ionizing radiations from certain types of electromagnetic waves have _____ wavelengths, _____ frequencies and
17. energies.
    A. shorter; higher
    B. shorter; lower
    C. longer; higher
    D. longer; lower

18. The illustration shown is an internationally recognized symbol for radioactive material. What will you do if you happen to see this on a material?

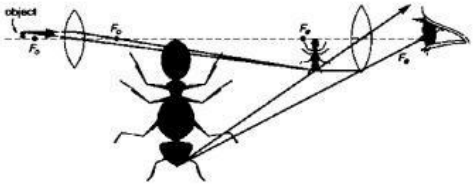
    A. Immediately leave the place.
    B. Leave the place as soon as possible but bring the radioactive material with you.
    C. Keep safe the material and keep it away as far as possible from you.
    D. Keep safe the material from where it is and contact and report it to the authorities as you immediately leave the premises.

19. A light ray is incident on a plane mirror and makes a 30° from the normal. This ray, when reflected off the surface of the plane mirror, forms an angle of reflection equal to _____.0
    A. Zero
    B. 30°
    C. 60°
    D. 90°

20. A card marked with **AHM8TU0WY** is standing upright in front of a plane mirror. Which of the following is **NOT** true about the image?
    A. The image is virtual.
    B. The image changes position as the observer changes position.
    C. The image appears as **YW0UT8MHA** to a person looking at the mirror.
    D. The image is the same size as the object.
21. Which characteristic distinguishes an electric motor from an electric generator?
    A. Type of current (AC/DC)
    B. Number of coils
    C. Direction of energy conversion (electrical to mechanical vs. mechanical to electrical)
    D. Output voltage

22. Sun's rays are observed to focus at a point behind the fishbowl near the window. The fishbowl act as what type of lens?
    A. Converging Lens
    B. Diverging Lens
    C. Focusing Lens
    D. None of the above

23. The image of an object is formed in a simple compound microscope as shown in the diagram. Which describes the final image?



    A. The final image is formed by the eyepiece lens, is real and enlarged.
    B. The final image is formed by the objective lens, is real but reduced.
    C. The final image is formed by the eyepiece lens, is virtual and enlarged.
    D. The final image is formed by the objective lens, is virtual but reduced.

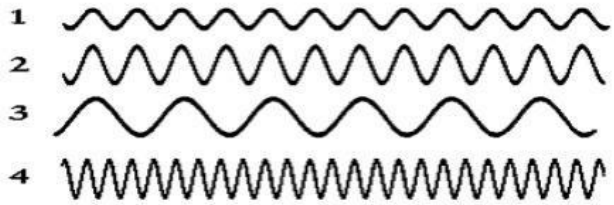
24. What does a positive magnification value indicate about an image formed by a lens?
    A. The image is real and inverted.
    B. The image is virtual and upright.
    C. The image is reduced in size.
    D. The image is inverted and smaller.

25. What is the focal length (f) of a convex lens that produces a real image 20 cm from the lens when the object distance (do) is 30 cm?
    A. 10 cm
    B. 15 cm
    C. 20 cm
    D. 60 cm

26. What is the primary function of the convex lens in a camera?
    A. To reflect light onto the image sensor
    B. To magnify the object
    C. To focus light onto the image sensor
    D. To reduce the image size

27. Based on the illustration below, which could best represent the electromagnetic wave that has the *highest* energy among others?

    A. Wave 1
    B. Wave 2
    C. Wave 3
    D. Wave 4



28. What is the wavelength of visible light if its frequency is 5.0×10^{14} Hz?
    A. 1.7×10^{6} m
    B. 1.7×10^{-6} m
    C. 6.0×10^{-7} m
    D. 6.0×10^{7} m

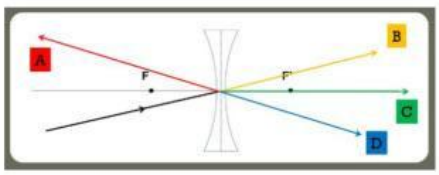
29. Which of the following statements is more accurate in describing a certain type of electromagnetic wave that is 5.0 nanometers (5.0×10^{-9} m) long?
    A. The electromagnetic wave is an X-ray.
    B. It is a microwave with a frequency of 6.0×10^{-1} Hz.
    C. It is an electromagnetic wave with an energy equal to 4.0×10^{-17} joules (J).
    D. It is an X-ray, an ionizing radiation, with an energy equal to 4.0×10^{-17} J and a frequency of 6.0×10^{16} Hz.

30. Radio waves differ from the visible light. What difference do radio waves has as compared to visible light?
    A. It travels slower
    B. It travels faster
    C. It has higher frequency
    D. It has lower frequency

31. In an AM radio broadcasting, the _____ of the radio waves *changes* to match that of the audio frequency signal.
    A. amplitude
    B. energy
    C. frequency
    D. speed

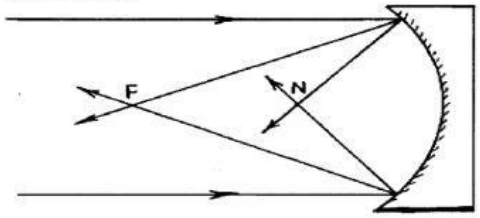
32. Ray diagrams are used to _____.
    A. draw the images formed
    B. locate the focal point of and describe the mirror
    C. help determine the location of the image formed
    D. distinguish what kind of mirror is being used

33. Which ray correctly shows the reflected ray of a light striking the object through the vertex of a curve mirror?



    A. Ray A
    B. Ray B
    C. Ray C
    D. Ray D

34. White light, composed of the different colors ROYGBV, is incident on a concave mirror and focused as shown in the next figure. Where will the yellow and violet components of the light be focused?
    A. The yellow light will be focused at the mirror's center of curvature (C) while the violet light at the focal point (F).
    B. The violet light will be focused at the mirror's center of curvature (C) while the yellow light at the focal point (F).
    C. Both color components of the light can be focused on either location.
    D. All colors of the light are focused on one point, which is at the principal focus (F).



35. A chess piece that is 10 *cm* tall is placed 30 *cm* in front of a concave mirror that has a focal length of 25 *cm*. Where is the image formed?
    A. 13 *cm* behind the mirror
    B. 13 *cm* in front of the mirror
    C. 150 *cm* behind the mirror
    D. 150 *cm* in front of the mirror

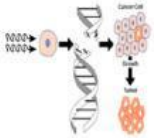
36. Based on the previous problem, which of the following statements completely describes the image formed?
    A. The image formed is virtual.
    B. The image formed is real.
    C. The image formed is real and inverted.
    D. The enlarged image is real, inverted, and found beyond the mirror's center of curvature.

37. What happens to a cell when radiation interacts with a cell wall or DNA?
    A. the cell becomes energized
    B. the radiation shifts to a different waveform
    C. the cell becomes radioactive
    D. the cell either dies or becomes a different kind of cell such as cancer cell

38. Some of the most common effects of ionizing radiation is/are _____.
    A. inhibition of cell division
    B. alteration of membrane permeability
    C. chromosome aberrations
    D. all of the choices are effects of ionizing radiation

39. Which of the following illustration/s provide benefit to society derive from electromagnetic waves?
    I II III IV





    A. I only
    B. II only and III
    C. I, II
    D. I, II and IV

40. In a simple electric motor, what happens when an electric current flows through the coil placed within a magnetic field?
    A. The coil expands and contracts
    B. The coil rotates due to electromagnetic torque
    C. The coil generates heat
    D. The coil produces electromagnetic induction

41. Which radio wave frequency is utilized when you use the GPS apps installed on your mobile phone?
    A. low-frequency
    B. medium frequency
    C. very high frequency
    D. ultra-high frequency

42. How do microwaves cook food?
    A. The waves cause the molecules to become excited and vibrate which causes friction between molecules that generates the heat to cook the food.
    B. The waves create a dry heat that warms the molecules in the food.
    C. The waves heat the food molecules in a similar way as a conventional oven.
    D. The waves send heat to the molecules which makes them begin to vibrate and cook.

43. The type of microwave wavelength used in satellite communication differs from the one used in cooking. Which uses long wavelengths and which uses short wavelengths, respectively?
    A. Satellite communication; cooking
    B. Cooking; satellite communication
    C. Both applications use long wavelengths
    D. Both applications use short wavelengths

44. What are these electromagnetic waves sometimes called *heat rays*?
    A. Gamma rays
    B. Infrared rays
    C. Radio waves
    D. Visible light

45. A night vision goggle or an infrared camera shows an image of a human body with color of shades of blue to green. What does this indicate about the body's temperature?
    A. The temperature of the body is warmer.
    B. The temperature of the body is cooler.
    C. The temperature of the body changes from warm to cool.
    D. The temperature of the body changes from cool to warm.

46. What is the fundamental principle behind electric generators?
    A. Electromagnetic induction
    B. Electrostatic attraction
    C. Electromagnetic repulsion
    D. Magnetic levitation

47. In an electric generator, what occurs when a coil rotates within a magnetic field?
    A. Electromagnetic repulsion generates voltage
    B. Electrostatic attraction produces current
    C. Electromagnetic induction induces voltage
    D. Magnetic flux creates resistance

48. How does the number of turns in a solenoid affect the electromotive force (emf) induced by changes in magnetic flux?
    A. The induced emf is directly proportional to the number of coils in a solenoid.
    B. The induced emf is inversely proportional to the number of coils in a solenoid.
    C. The induced emf is proportional to the square of the number of coils in a solenoid.
    D. The induced emf is inversely proportional to the square of the number of coils in a solenoid.

49. What's the primary difference between an electric motor and an electric generator?
    A. Motor converts mechanical energy to electrical while generator converts electrical to mechanical.
    B. Motor uses DC power while generator uses AC power.
    C. Motor has more coils while generator has fewer coils.
    D. Motor produces heat while generator produces light.

50. Mobile phones emit non-ionizing radiation and thus are not radioactive which pose a very low danger risk.
    A. The statement above is a FACT.
    B. The statement above is only a MYTH.
    C. The statement above is at times a FACT and at times a MYTH.
    D. The credibility of the statement is questionable.

51. Which safety in society must be watched out for since prolonged or high exposures to EM radiation especially ionizing radiation can cause serious damage in the cells including cancer and genetic damage?
    A. Health Protection
    B. Environmental Safety
    C. Medical and Industrial Application
    D. Public Awareness and Protection

52. Which explains the relationship between the frequency and wavelength of electromagnetic waves in $v = \lambda f$?
    A. EM waves travel at the speed of light.
    B. Frequency of EM waves increases as wavelength increases.
    C. Speed of EM waves increases as the frequency and wavelength of the wave decreases.
    D. EM waves travel at the speed of light, and the wavelength decreases as the frequency increases.

53. In 1864, what was discovered by Maxwell that led to the electromagnetic theory of light?
    A. Light is a wave and acts as a particle.
    B. Light is a particle manifesting as a wave.
    C. Light is a propagating wave of electric and magnetic field.
    D. Light has a magnetic effect based on the direction of current.

54. Which of the following can generate an electromagnetic wave?
    A. any moving charge
    B. any accelerating charge
    C. only a charge with changing acceleration
    D. only a charge moving in a circle

55. How do you describe the type of wave electromagnetic waves and the direction of motion of both fields (electric and magnetic) with respect to the direction of propagation?
    A. longitudinal; parallel
    B. longitudinal; perpendicular
    C. transverse; perpendicular
    D. transverse; parallel

56. Which of the following correctly lists the electromagnetic waves in order of decreasing wavelength?
    A. gamma rays, UV rays, infrared rays, microwaves
    B. microwaves, UV rays, visible light, gamma rays
    C. radio waves, infrared rays, gamma rays, UV rays
    D. microwaves, infrared rays, visible light, X-rays

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