1. Which of the following equations represents motion in 2D?
A) s = ut + 0.5at^2 B) v = u + at C) F = ma D) E = mc^2
2. A charged object exerts a force on another charged object according to _____.
A) Newton's First Law C) Newton's Second Law
B) Coulomb's Law D) Ohm's Law
3. What is the SI unit of electric charge?
A) Ampere B) Joule C) Coulomb D) Volt
4. The resistance of a wire _____ as the length of the wire increases.
A) increases C) decreases
B) remains constant D) becomes zero
5. What is the direction of the magnetic field around a straight current-carrying wire?
A) Radial outward. C ) Radial inward
B) Circular clockwise. D) Circular counterclockwise
6. What type of current flows in a closed circuit?
A) Direct current
B) Alternating current
C) Both direct and alternating current
D) No current flows in a closed circuit
7. Which of the following components regulates the amount of current flowing through a circuit?
A) Resistor B) Capacitor C) Inductor D) Transistor
8. What is the energy stored in a capacitor proportional to?
A) Voltage B) Current C) Resistance D) Inductance
9. Which of the following statements about electromagnetic waves is correct?
A) They are mechanical waves
B) They require a medium to propagate
C) They can travel through vacuum
D) They cannot be polarized
10. What is the law of reflection?
A) The angle of incidence is equal to the angle of refraction
B) The angle of incidence is equal to the angle of reflection
C) The angle of refraction depends on the wavelength of light
D) The angle of reflection depends on the speed of light
11. A convex lens always forms a _____ image.
A) Virtual B) Real C) Inverted D) Magnified
12. Which color of light has the highest frequency?
A) Red B) Green C) Blue D) Yellow
13. The speed of light in a vacuum is approximately _____.
A) 3 x 10^2 m/s C) 3 x 10^5 m/s
B) 3 x 10^8 m/s D) 3 x 10^11 m/s
14. Which of the following devices converts electrical energy into mechanical energy?
A) Transformer B) Motor C) Generator D) Diode
15. What is the unit of electric potential?
a) Volt B) Ampere C) Ohm D) Coulomb
16. Which of the following is the correct equation for calculating the electric force between two charged objects?

a) F = q1q2/r^2 B) F = ma C) F = mgh D) F = mv

17. A conductor allows _____ to flow through it easily.

A) Heat B) Light C) Sound D) Electric current

18. What is the SI unit of magnetic field strength?

A) Ampere B) Joule C) Tesla D) Ohm

19. Which of the following is an example of a non-contact force?

A) Friction B) Tension C) Magnetism D) Gravity

20. Which of the following materials is a good conductor of electricity?

A) Wood B) Glass C) Rubber D) Copper

21. The current flowing through a circuit is inversely proportional to _____.

A) Resistance B) Voltage C) Power D) Capacitance

22. What is the direction of an electric field around a positively charged object?

A) Away from the object C) Towards the object

B) Parallel to the object. D) Perpendicular to the object

23. Which of the following components can store electrical charge?

A) Resistor B) Capacitor C) Inductor D) Transistor

24. What is the direction of the force on a current-carrying wire placed in a magnetic field?

A) Parallel to the magnetic field

B) Perpendicular to the magnetic field

C) Opposite to the magnetic field

D) Same as the magnetic field

25. Which of the following statements about Ohm's Law is correct?

A) Current is directly proportional to voltage

B) Resistance is inversely proportional to voltage

C) Power is inversely proportional to resistance

D) Voltage is inversely proportional to current

26. Which of the following components amplifies electrical signals?

A) Resistor B) Capacitor C) Inductor D) Transistor

27. What is the relationship between the period and frequency of an oscillating electrical signal?

A) They are equal to each other C ) Period = 1/frequency

B) Frequency = 1/period D) They are not related

28. Which of the following electromagnetic waves has the highest energy?

A) Radio waves B) Microwaves C) X-rays D) Infrared waves

29. What is the law of refraction?

A) The angle of incidence is equal to the angle of refraction

B) The angle of incidence is equal to the angle of reflection

C) The angle of refraction depends on the wavelength of light

D) The angle of reflection depends on the speed of light

30. Which type of lens can correct nearsightedness?

A) Convex lens C) Concave lens

B) Bifocal lens D) Plano-convex lens

31. Which of the following colors of light is refracted the most?

A) Red B) Green C) Blue D) Yellow

32. The bending of a wave as it passes from one medium to another is called _____.

A) Reflection B) Diffraction C) Refraction D) Interference

33. Which of the following is an example of a semiconductor?
A) Copper wire B) Aluminum foil C) Silicon chip D) Glass
34. What is the unit of electric current?
A) Ampere B) Joule C) Tesla D) Volt
35. The flow of electric charge is called _____.
A) Current B) Resistance C) Voltage D) Power
36. Which of the following materials is a good insulator of electricity?
A) Copper B) Aluminum C) Rubber D) Silver
37. The opposition to the flow of electric current is called _____.
A) Current B) Resistance C) Voltage D) Power
38. What property of an object determines the amount of charge it can hold?
A) Conductivity B) Resistivity C) Capacitance D) Inductance
39. Which of the following statements about transformers is correct?
A) They convert AC to DC
B) They convert DC to AC
C) They change voltage levels in AC circuits
D) They generate electricity from mechanical energy
40. What type of current flows in power transmission lines?
A) Direct current
B) Alternating current
C) Both direct and alternating current
D) No current flows in power transmission lines
41. What is the unit of electric power?
A) Volt B) Ampere C) Ohm D) Watt
42. The splitting of white light into its component colors is called _____.
A) Reflection B) Diffraction C) Refraction D) Dispersion
43. Which of the following electromagnetic waves has the lowest frequency?
A) Radio waves B) Microwaves C) X-rays D) Infrared waves
44. What determines the color of an object?
A) Its temperature C) Its mass
B) Its chemical composition D) Its refractive index
45. Which of the following devices emits coherent light?
A) Incandescent bulb C) Fluorescent tube
B) Laser diode D) LED
46. Which of the following phenomena explains the formation of rainbows?
A) Reflection B) Diffraction C) Refraction D) Interference
47. The bending of light waves around obstacles is called _____.
A) Reflection B) Diffraction C) Refraction D) Dispersion
48. What is the speed of light in a medium with a refractive index of 1.5?
A) 1 x 10^2 m/s C) 1 x 10^5 m/s
B) 1 x 10^8 m/s D) 2 x 10^8 m/s
49. Which of the following is an example of total internal reflection?
A) Reflection of light from a mirror
B) Refraction of light through a prism
C) Light passing through a transparent object

D) Light bouncing off a rough surface

50. The bending of light as it passes through a lens is called _____.

A) Reflection B) Diffraction C) Refraction D) Dispersion

51. The color of an opaque object is determined by its _____.

A) Absorption B) Reflection C) Transmission D) Refraction

52. What type of lens can correct farsightedness?

A) Convex lens C) Concave lens.

B) Bifocal lens D) Plano-convex lens

53. The bending of light waves when they pass through an opening or around an obstacle is called _____.

A) Reflection B) Diffraction C) Refraction D) Dispersion

54. Which of the following objects is not affected by refraction?

A) Prism B) Lens C) Mirror D) Air bubble in water

55. Which of the following electromagnetic waves has the highest frequency?

A) Radio waves B) Microwaves C) X-rays D) Infrared waves

56. What determines the shape of a lens?

A) Its thickness C) Its index of refraction

B) Its focal length D) Its curvature

57. Which color of light is refracted the least?

A) Red B) Green C) Blue D) Yellow

58. The image formed by a concave mirror is always _____.

A) Virtual B) Real C) Inverted D) Magnified

59. What is the relationship between the object distance and the image distance for a convex lens?

A) Object distance = image distance

B) Object distance > image distance

C) Object distance < image distance

D) Object distance is not related to image distance

60. Which of the following electromagnetic waves has the lowest energy?

A) Radio waves B) Microwaves C) X-rays D) Infrared waves

61. What is the direction of the force on a positive charge placed in an electric field?

A) Away from the charge C) Towards the charge

B) Parallel to the charge D) Perpendicular to the charge

62. Which of the following devices converts mechanical energy into electrical energy?

A) Transformer B) Motor C) Generator D) Diode

63. What is the relationship between the power, current, and voltage in an electrical circuit?

A) Power = current/voltage C) Power = voltage/current

B) Power = current x voltage D) Power = current + voltage

64. Which of the following materials is a good conductor of heat?

A) Glass B) Wood C) Plastic D) Metal

65. What is the direction of the magnetic field around a bar magnet?

A) Radial outward C) Radial inward

B) Circular clockwise D) Circular counterclockwise

66. Which of the following components stores energy in a magnetic field?

A) Resistor B) Capacitor C) Inductor D) Transistor

67. The magnitude of the magnetic field inside a solenoid depends on _____.

A) The length of the solenoid

Bb) The number of turns in the solenoid
C) The current flowing through the solenoid
D) All of the above
68. What causes electric charges to flow in a circuit?
A) Voltage B) Resistance C) Power D) Capacitance
69. Which of the following statements about series circuits is correct?
A) The total resistance is equal to the sum of individual resistances
B) The total current is equal to the sum of individual currents
C) The voltage across each component is the same
D) All of the above
70. Which of the following components can detect and amplify radio frequency signals?
A) Resistor B) Capacitor C) Inductor D) Transistor
71. What is the relationship between the frequency and wavelength of an electromagnetic wave?
A) They are inversely proportional to each other
B) Frequency = wavelength x speed
C) Frequency = speed/wavelength
D) They are not related
72. Which of the following electromagnetic waves has the highest wavelength?
A) Radio waves B) Microwaves C) X-rays D) Infrared waves
73. What is the process by which a beam of light splits into its component colors called?
A) Reflection B) Diffraction C) Refraction D) Dispersion
74. Which of the following objects reduce the speed of light the most?
A) Vacuum B) Air C) Water D) Diamond
75. What is the focal length of a diverging lens?
A) Positive B) Negative C) Zero D) Infinite
76. The angle of incidence is equal to the angle of reflection according to _____.
A) Fermat's principle C) Huygens' principle
B) Snell's law D) Ohm's law
77. Which of the following electromagnetic waves can cause ionization of atoms?
A) Radio waves B) Microwaves C) X-rays D) Infrared waves
78. What is the process by which a beam of light bends when passing from one medium to another called?
A) Reflection B) Diffraction C) Refraction D) Dispersion
79. In a converging lens, parallel light rays _____.
A) Diverge B) Intersect C) Reflect D) Disperse
80. Which of the following electromagnetic waves has the lowest energy?
A) Radio waves B) Microwaves C) X-rays D) Infrared waves
81. What is the direction of an electric field inside a parallel plate capacitor?
A) Away from the capacitor. C) Towards the capacitor
B) Parallel to the plates. D) Perpendicular to the plates
82. Which of the following devices converts electrical energy into light energy?
A) Transformer B) Motor C) Generator D) LED
83. What is the relationship between the current and resistance in an electrical circuit?
A) Current = resistance/voltage C) Current = voltage/resistance
B) Current = voltage+resistance D)Current=voltage x resistance
84. Which of the following materials is a good conductor of sound?

A) Air B) Vacuum C) Water D) Wood

85. Which of the following statements about parallel circuits is correct?

A) The total resistance is equal to the sum of individual resistances

B) The total current is equal to the sum of individual currents

C) The voltage across each component is the same

D) All of the above

86. Which of the following components can convert AC to DC?

A) Resistor B) Capacitor C) Diode D) Transistor

87. What is the relationship between the period and frequency of an oscillating mechanical system?

A) They are equal to each other C) Period = 1/frequency

B) Frequency = 1/period D) They are not related

88. Which of the following electromagnetic waves has the highest speed in a vacuum?

A) Radio waves B) Microwaves C) X-rays D) Infrared waves

89. What causes a change in the speed of light when it enters a different medium?

A) Reflection B) Diffraction C) Refraction D) Dispersion

90. Which of the following objects are always reflected by a concave mirror?

A) Virtual objects C) Real objects

B) Inverted objects D) Magnified objects

91. What is the focal length of a converging lens?

A) Positive B) Negative C) Zero D) Infinite

92. The angle of refraction depends on _____.

A) The angle of incidence C) The wavelength of light

C) The speed of light D) The refractive index of the medium

93. What is the process by which light waves combine to form a single wave called?

A) Reflection B) Diffraction C) Refraction D) Interference

94. Which of the following objects are always refracted by a convex lens?

A) Virtual objects C) Real objects

B) Inverted objects D) Magnified objects

95. What is the relationship between the power and resistance in an electrical circuit?

A) Power = resistance/voltage C) Power = voltage/resistance

B) Power = voltage x resistance D) Power = voltage +resistance

96. Which of the following materials is a good conductor of light?

A) Vacuum. B) Air C) Water D) Glass

97. Which of the following electromagnetic waves can pass through Earth's atmosphere?

A) Radio waves B) Microwaves C) X-rays D) Gamma rays

98. What is the process by which a beam of light changes direction when it strikes a surface called?

A) Reflection B) Diffraction C) Refraction D) Dispersion

99. In a diverging lens, parallel light rays _____.

A) Diverge B) Intersect C) Reflect D) Disperse

100. Which of the following electromagnetic waves has the highest frequency?

A) Radio waves B) Microwaves C) X-rays D) Infrared waves

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