

## PHYSICS

**Q1. Why does ice covered in sawdust not melt quickly?**

- (a) Sawdust does not allow the air to touch the ice
- (b) The water is absorbed by sawdust
- (c) Sawdust is a bad conductor of heat
- (d) Sawdust is good conductor of heat

**Q2. The washing machine works on the principle of \_\_\_\_\_**

- (a) Dialysis
- (b) Diffusion
- (c) Reverse osmosis
- (d) Centrifugation

**Q3. An air bubble in water will act like a:**

- (a) Convex mirror
- (b) Convex lens
- (c) Concave mirror
- (d) Concave lens

**Q4. The frequency of direct current is \_\_\_\_\_**

- (a) Zero
- (b) 50 HZ
- (c) 60 HZ
- (d) 100 HZ

**Q5. If a body is moving on a circular path, what is its average velocity if it completes one cycle in one second?**

- (a) Average velocity depends upon time taken to complete one cycle
- (b) One
- (c) Average velocity is same as average speed
- (d) Zero

**Q6. Telephone exchange was invented by?**

- (a) Tivadar Puskas
- (b) Joseph Priestley
- (c) Petrache Poenaru
- (d) James Leonard Plimpton



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**Q7. What will happen to the force between the two positive charges which are released after being held near each other?**

- (a) Force will increase
- (b) Force will decrease
- (c) Force will stay the same
- (d) Force first increases to reach maximum before starting to decrease

**Q8. Which device is used to measure earthquakes?**

- (a) Endoscope
- (b) Thermometer
- (c) Sonograph
- (d) Seismograph

**Q9. Sea seems blue due to-**

- (a) Excess deepness
- (b) Reflection of sky and scattering of light by the drops of water
- (c) Blue colour of water
- (d) Upper layer of water

**Q10. Who invented PlayStation?**

- (a) Wright brothers
- (b) Reynold B. Johnson
- (c) Assen Jordanoff
- (d) Ken Kutaragi

**Q11. Instrument for measuring light intensity is called**

- (a) Lucimeter
- (b) Cryometer
- (c) Cyanometer
- (d) Barometer

**Q12. Which one among the following is not an electro-magnetic wave?**

- (a) X-Ray
- (b) Radio waves
- (c) Cathode Ray
- (d) Infrared Ray

**Q13. Which one of the following is a good electrical conductor?**

- (a) Graphite
- (b) Diamond
- (c) Peat
- (d) Charcoal

**Q14. Which of the following pair is incorrect?**

- (a) Hygrometer - Water vapour content of the atmosphere
- (b) Lactometer - Specific gravity of liquids
- (c) Anemometer - Speed of the wind
- (d) Seismograph – Earthquakes

**Q15. If a body is moving on a circular path, what is its average velocity if it completes one cycle in one second?**

- (a) Average velocity depends upon time taken to complete one cycle
- (b) One
- (c) Average velocity is same as average speed
- (d) Zero

**Q16. Why does a fountain pen leak in aeroplane flying at a height?**

- (a) Because of reduced viscosity of the ink in the pen
- (b) Because of increased viscosity of the ink in the pen
- (c) Because of higher atmospheric pressure outside the pen
- (d) Because of lower atmospheric pressure outside the pen

**Q17. Instrument for measuring wind velocity is called -**

- (a) Coulombmeter
- (b) Anemometer
- (c) Cyanometer
- (d) Chronometer

**Q18. Who was the first Indian astronaut to travel in space?**

- (a) Rakesh Sharma
- (b) Ravish Malhotra
- (c) Kalpana Chawla
- (d) Sheikh Muszaphar Shukor

**Q19. When a running car stops suddenly, the passengers tends to lean forward because of -**

- (a) Centrifugal force
- (b) Inertia of rest
- (c) Inertia of motion
- (d) Gravitation force

**Q20. If a boy is sitting in a train, which is moving at a constant velocity throws a ball straight up into the air, the ball will -**

- (a) fall in front of him
- (b) fall behind him
- (c) fall into hand
- (d) None of the above

**Q21. A person is hurt on kicking a stone due to -**

- (a) Inertia
- (b) Velocity
- (c) Reaction
- (d) Momentum

**Q22. For a body moving with non-uniform acceleration -**

- (a) Displacement-time graph is linear
- (b) Displacement-time graph is non-linear
- (c) Velocity-time graph is non-linear
- (d) Velocity-time graph is linear

**Q23. A parachute descends slowly whereas a stone dropped from the same height falls rapidly, because -**

- (a) Stone is heavier than parachute
- (b) Special mechanisms are present in parachute
- (c) A parachute has a larger surface area and air resistance is more
- (d) None of the above

**Q24. A pendulum clock can run faster in-**

- (a) Summer
- (b) Winter
- (c) Spring season
- (d) Rainy season

**Q25. Oil spreads on water surface because-**

- (a) Oil is denser than water
- (b) Oil is less dense than water
- (c) Surface tension of oil is more than water
- (d) Surface tension of oil is less than water

**Q26. At what temperature (in degree Celsius), the numerical values on Celsius and Fahrenheit scales become equal?**

- (a) -40
- (b) 40
- (c) 273
- (d) -273

**Q27. What is the process of conversion of solid state directly to gaseous state called?**

- (a) Evaporation
- (b) Condensation
- (c) Sublimation
- (d) Distillation



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**Q28. When a ball is thrown vertically upwards, which of the following quantities remains constant during its motion?**

- (a) Acceleration due to gravity
- (b) Displacement
- (c) Velocity
- (d) None of these

**Q29. What is the SI unit of heat energy?**

- (a) Joule
- (b) Newton
- (c) Calorie
- (d) Kelvin

**Q30. If the orbit of a planet is an ellipse then what is the point at which the Sun is located called?**

- (a) Centre
- (b) Circumcentre
- (c) Incentre
- (d) Focus

**Q31. The laws which govern the motion of planets are called \_\_\_\_\_.**

- (a) Newton's Laws
- (b) Kepler's Laws
- (c) Avogadro's Laws
- (d) De Morgan's Laws

**Q32. Convex and concave mirrors are examples of?**

- (a) Plane mirrors
- (b) Spherical mirrors
- (c) Inverted mirror
- (d) Erect mirror

**Q33. The frictional force exerted by fluids is also called \_\_\_\_\_.**

- (a) Drag
- (b) Buoyancy
- (c) Upthrust
- (d) Convection

**Q34. Which one of the following is a good electrical conductor?**

- (a) Graphite
- (b) Diamond
- (c) Peat
- (d) Charcoal

**Q35. Which of the following pair is incorrect?**

- (a) Hygrometer - Water vapour content of the atmosphere
- (b) Lactometer - Specific gravity of liquids
- (c) Anemometer - Speed of the wind
- (d) Seismograph - Earthquakes

**Q36. Diamond does not conduct electricity mainly because -**

- (a) Its structure is very compact
- (b) It is of crystalline nature
- (c) There are only carbon atoms present in it
- (d) No free electrons are present in it

**Q37. Why is weightlessness experienced while orbiting the earth in space ships?**

- (a) Inertia
- (b) Acceleration
- (c) Zero gravity
- (d) Orbital motion

**Q38. Who invented Television?**

- (a) J L Baird
- (b) Aristotle
- (c) James Clerk Maxwell
- (d) Nikola Tesla

**Q39. Electroscope was invented by -**

- (a) William Gilbert
- (b) Alfred Nobel
- (c) Joseph Nicéphore Niépce
- (d) Ted Nelson

**Q40. The light with the shortest wavelength is**

- (a) Red
- (b) Yellow
- (c) Blue
- (d) Violet

**Q41. Sewing machine was first patented by -**

- (a) Alfred P. Southwick
- (b) Elias Howe
- (c) Murasaki Shikibu
- (d) Hanaoka Seishu

**Q42. What is impulse equal to?**

- (a) Change in momentum
- (b) Change in force
- (c) Change in velocity
- (d) Change in acceleration

**Q43. ISRO built India's first satellite known as \_\_\_\_.**

- (a) Aryabhata
- (b) Bhaskara
- (c) Rohini
- (d) Insat 1A

**Q44. The cooling by a desert cooler is based on-**

- (a) Hot air replacement
- (b) Air dehydration
- (c) Evaporative cooling
- (d) Air rehydration

**Q45. Cooling by air conditioner is done by-**

- (a) Flow of water
- (b) Release of compressed gas
- (c) Cooking gas
- (d) Melting the solid

**Q46. On adding common salt to water, the boiling point and freezing point of water will:**

- (a) Increase
- (b) Decrease
- (c) Decrease and increase respectively
- (d) Increase and decrease respectively

**Q47. Good conductor of electricity is -**

- (a) Dry air
- (b) Paper
- (c) Kerosene
- (d) Graphite

**Q48. Fish can survive in a frozen lake because-**

- (a) Fish are warm blooded animals
- (b) Fish hibernate in ice
- (c) Water near the bottom does not freeze
- (d) Ice is a good conductor of heat

**Q49. The colour of light is determined by its**

- (a) Amplitude
- (b) Wavelength
- (c) Intensity
- (d) Velocity



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**Q50. Which one of the following is used as a moderator in the nuclear reactor?**

- (a) Thorium
- (b) Graphite
- (c) Radium
- (d) Ordinary water

**Q51. Reflection from a smooth surface like that of a mirror is called \_\_\_\_\_ reflection.**

- (a) Regular
- (b) Irregular
- (c) Diffused
- (d) Fused

**Q52. Which of the following is not a vector quantity?**

- (a) Momentum
- (b) Displacement
- (c) Torque
- (d) Speed

**Q53. At what temperature (in Fahrenheit) pure water freezes?**

- (a) 32
- (b) 0
- (c) 48
- (d) 37

**Q54. What is the other name of Galileo's law of falling bodies?**

- (a) Law of motion
- (b) Newton's first law
- (c) Newton's second law
- (d) Newton's third law

**Q55. Which one among the following components is used as an amplifying device?**

- (a) Transformer
- (b) Diode
- (c) Capacitor
- (d) Transistor

**Q56. The unit of measurement of Noise is -**

- (a) Decibel
- (b) Hertz
- (c) Amplifier
- (d) Acoustics

**Q57. Which one of the following processes is responsible for the glittering of air bubble rising through water?**

- (a) Reflection of light
- (b) Refraction of light
- (c) Total internal reflection of light
- (d) Scattering of light

**Q58. In an optical fibre the signal is transmitted -**

- (a) In a straight line path
- (b) In a curved path
- (c) Due to total internal reflection
- (d) Due to refraction

**Q59. Which of the following has the lowest frequency?**

- (a) Visible light
- (b) Gamma rays
- (c) X-rays
- (d) Ultra violet rays

**Q60. Who discovered theory of relativity?**

- (a) Isaac Newton
- (b) Albert Einstein
- (c) Neil Bohr
- (d) Michael Faraday

**Q61. \_\_\_\_\_ is same on every point on a rotating body.**

- (a) Linear velocity
- (b) Linear momentum
- (c) Angular torque
- (d) Angular velocity

**Q62. The path of a projectile is called its \_\_\_\_\_.**

- (a) Altitude
- (b) Range
- (c) Trajectory
- (d) Flight

**Q63. Who invented the Contact Lens?**

- (a) Enrico Fermi
- (b) Adolf Gaston Eugen Fick
- (c) Sandford Fleming
- (d) Benoit Fourneyron

**Q64. Electrons move around the nucleus in \_\_\_\_\_ motion.**

- (a) Translatory
- (b) Spin
- (c) Orbital
- (d) Vibrational

**Q65. Blood pressure is measured by \_\_\_\_\_.**

- (a) Barometer
- (b) Sphygmomanometer
- (c) Hydrometer
- (d) Thermometer

**Q66. Isaac Newton invented \_\_\_\_\_.**

- (a) Thermometer
- (b) Reflecting Telescope
- (c) Hydraulic Accumulator
- (d) Transistor

**Q67. How many units of electricity will be consumed if you use a 60-watt electric bulb for 5 hours everyday for 30 days?**

- (a) 12
- (b) 9
- (c) 6
- (d) 3

**Q68. The important nuclear fuel available in India in abundance is :**

- (a) Uranium
- (b) Thorium
- (c) Iridium
- (d) Plutonium

**Q69. Match List-I with List-II and select the correct answer by using the codes given below:**

**List-I**

**(Atomic Power Station)**

- A. Kalpakkam
- B. Narora
- C. Kakrapara
- D. Trombay

**Code :**

- A B C D
- (a) 1 2 3 4
- (b) 3 1 2 4
- (c) 3 1 4 2
- (d) 2 3 4 1

**List-II**

**(State of Situation)**

- 1. Uttar Pradesh
- 2. Gujarat
- 3. Tamilnadu
- 4. Maharashtra

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**Q70. Which one of the following thermometers is known as pyrometer?**

- (a) Thermo-electric thermometers
- (b) Radiation thermometers
- (c) Gas thermometers
- (d) Liquid thermometers

**Q71. The safest temperature for keeping food fresh in a refrigerator is**

- (a) 4°C
- (b) 8°C
- (c) 0°C
- (d) 10°C

**Q72. Which instrument is used in submarine to see the objects above sea level?**

- (a) Pykometer
- (b) Polygraph
- (c) Photometer
- (d) Periscope

**Q73. Why does food cook faster in a pressure cooker?**

- (a) The increased pressure increases the boiling point.
- (b) Does not waste steam.
- (c) The food is cooked quickly by steam.
- (d) The water boils at constant temperature.

**Q74. A device which converts electrical energy into mechanical energy is-**

- (a) Dynamo
- (b) Transformer
- (c) Electric motor
- (d) Inductor

**Q75. Electric motors operating at low voltages tend to burn out because-**

- (a) They draw more current which is inversely proportional to the voltage.
- (b) They draw more current which is inversely proportional to the square root of the voltage.
- (c) They draw heat proportional to  $V^2$ .
- (d) Low voltage sets in electrical discharge.

**Q76. What is the SI unit of intensity of sound?**

- (a) Decibel
- (b) Newton
- (c) Hertz
- (d) Tesla

**Q77. Which colour is formed when Blue and Green are mixed?**

- (a) Cyan
- (b) Brown
- (c) Black
- (d) Violet

**Q78. What is the SI unit of Power?**

- (a) Boyle
- (b) Watt
- (c) Newton
- (d) Pascal

**Q79. The gas used in discharge tubes for optical decoration and advertising is-**

- (a) Carbon dioxide
- (b) Ammonia
- (c) Sulphur dioxide
- (d) Neon

**Q80. The distance-time graph for the motion of an object moving with a constant speed is a**

- \_\_\_\_\_.
- (a) Dot
  - (b) Circle
  - (c) Straight Line
  - (d) Curve

**Q81. If the force applied on the object is in the direction of its motion, the speed of the object**

- \_\_\_\_\_.
- (a) Increases
  - (b) Stops
  - (c) Decreases
  - (d) No effect

**Q82. Sphygmomanometer measures the blood pressure in the**

- (a) Veins
- (b) Arteries
- (c) Eyes
- (d) Synovial

**Q83. The reverse effect of X-ray emission is**

- (a) Raman effect
- (b) Compton effect
- (c) Zeeman effect
- (d) Photo-electric effect

**Q84. The group of solar cells joined together in a definite pattern is called a**

- (a) Battery
- (b) Solar Heater
- (c) Solar cooker
- (d) Solar cell panel

**Q85. The study of origin and evolution of universe is known as \_\_\_\_\_.**

- (a) Cosmology
- (b) Astrology
- (c) Seismology
- (d) Limnology

**Q86. If a ball is thrown up, which of the following does not change?**

- (a) Acceleration due to gravity
- (b) Speed
- (c) Potential energy
- (d) Distance

**Q87. The SI unit of intensity of sound is \_\_\_\_.**

- (a) Watt per square meter
- (b) Joule per square meter
- (c) Newton per square meter
- (d) Tesla per square meter

**Q88. To keep drinks at the same temperature for quite sometime, the walls of thermos bottle are coated with:**

- (a) Aluminium paint
- (b) Lead Powder
- (c) Silver layer
- (d) Mercury Layer

**Q89. The atmosphere exerts enormous pressure on us. But, we do not feel it because**

- (a) Our blood exerts a pressure slightly more than that of the atmosphere
- (b) We are used to it
- (c) Our bones are very strong and can withstand the pressure
- (d) The surface area of our head is very small

**Q90. The sensation of weightlessness in a spacecraft in an orbit is due to the -**

- (a) Absence of gravity outside
- (b) Acceleration in the orbit which is equal to the acceleration due to gravity outside
- (c) Presence of gravity outside but not inside the spacecraft
- (d) Fact that spacecraft in the orbit has no energy

**Q91. It is easier to carry two buckets of water in one hand each, than to carry only one in one hand because -**

- (a) weight of buckets are balanced
- (b) centre of gravity falls within the body
- (c) centre of gravity and centre of equilibrium fall within the feet
- (d) resultant weight of buckets is zero

**Q92. In a nuclear reactor, one of the following is used as a fuel?**

- (a) Coal
- (b) Uranium
- (c) Radium
- (d) Diesel

**Q93. Tungsten is used for the manufacture of the filament of an electric bulb, because -**

- (a) it is a good conductor
- (b) it is economical
- (c) it is malleable
- (d) it has a very high melting point

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**Q94. Moving Electric Charge produces -**

- (a) Magnetic field
- (b) Sound waves
- (c) Light rays
- (d) Heat waves

**Q95. Kerosene rises in the wick of the stove is due to -**

- (a) Osmosis
- (b) Diffusion
- (c) Surface tension
- (d) Biogen contraction

**Q96. The reason of mirage is**

- (a) Interference of light
- (b) Diffraction of light
- (c) Polarization of light
- (d) Total internal reflection of light

**Q97. Red light is used in traffic signals because**

- (a) It has the longest wavelength
- (b) It is beautiful
- (c) It is visible to people even with bad eyesight
- (d) None of the above reasons

**Q98. If  $V_a$ ,  $V_w$  and  $V_s$  respectively are the speed of sound in air, water and steel, then-**

- (a)  $V_a < V_w < V_s$
- (b)  $V_s < V_w < V_a$
- (c)  $V_w < V_s < V_a$
- (d)  $V_s < V_a < V_w$

**Q99. How much should minimum distance be between the source of sound and reflecting surface, so that an echo can be heard clearly?**

- (a) 10 meter
- (b) 17 meter
- (c) 24 meter
- (d) 30 meter

**Q100. Consider the following statements about ultrasonic waves:**

1. They can destroy insects.
2. They can clean clothes by removing dust.
3. They can be used to treat diseases.
4. They can control automatic doors.

Of the above statements

- (a) 1 and 2 are correct
- (b) 3 and 4 are correct
- (c) 1, 2 and 3 are correct
- (d) All are correct

## Solutions

### S1. Ans.(c)

**Sol.** Saw dust is used to cover ice because it is poor conductor of heat. It did not let the ice melt quickly, as it does not transfer the heat of the surrounding to the ice.

### S2. Ans.(d)

**Sol.** The washing machine works on the principle of Centrifugation.

### S3. Ans.(d)

**Sol.** Air is optically rarer than water, the ray of light bends away from the normal at the point of incidence when moving from water to air while it bends towards the normal while moving from air to water. It is clearly visible that the air bubble acts as a DIVERGING LENS (concave lens) in water.

### S4. Ans.(a)

**Sol.** DC implies no changes in value. Frequencies of signals are defined by how many changes per time, e.g. 60 cycles per second. In case of DC with there are 0 changes per second. Hence the frequency of DC is zero.

### S5. Ans.(d)

**Sol.** When a body is moving in a circular path, its average velocity when it complete one cycle in one second is zero.

### S6. Ans.(a)

**Sol.** Telephone exchange was invented by Tivadar Puskas.

### S7. Ans.(b)

**Sol.** Two Positive charges will repel to each other so the force will decrease between two positive charge.

### S8. Ans.(d)

**Sol.** A Seismometer is an instrument that measures motion of the ground, caused by, for example, an earthquake, a volcanic eruption, or the use of explosives.

### S9. Ans.(b)

**Sol.** "The ocean looks blue because red, orange and yellow (long wavelength light) are absorbed more strongly by water than is blue (short wavelength light). So when white light from the sun enters the ocean, it is mostly the blue that gets returned.

### S10. Ans.(d)

**Sol.** PlayStation was the brainchild of Ken Kutaragi, a Sony executive who had just finished managing one of the company's hardware engineering divisions at that time and would later be dubbed as "The Father of the PlayStation".

### S11. Ans.(a)

**Sol.** Lucimeter is an instrument used for measuring light intensity.

**S12. Ans.(c)**

**Sol.** Electromagnetic radiation refers to the waves of the electromagnetic field, propagating through space-time, carrying electromagnetic radiant energy. It includes radio waves, microwaves, infrared, visible light, ultraviolet, X-rays, and gamma rays.

**S13. Ans.(a)**

**Sol.** Graphite is a very good conductor of electricity due to the mobility of the electrons in its outer valence shells.

**S14. Ans.(b)**

**Sol.** A lactometer is an instrument used to check purity of milk.

**S15. Ans.(d)**

**S16. Ans.(d)**

**Sol.** The atmospheric pressure decreases with altitude because gas molecules which make up the air concentrate near lower altitude in response to Earth's gravity. Hence, air pressure is low at higher altitudes. Due to this difference in air pressure, the air inside the pen forces the ink to come out.

**S17. Ans.(b)**

**Sol.** An anemometer is a device used for measuring the speed of wind.

**S18. Ans.(a)**

**Sol.** Rakesh Sharma was the first Indian to travel in Space. He was born on 13th January 1949 in Punjab, India. He flew to the Salyut 7 Space Station.

**S19. Ans.(c)**

**Sol.** When the bus is running, the whole body of the passenger is in the state of motion. When the bus stops suddenly, the lower part of the passengers body which is in contact with the bus, comes to rest. But the passengers upper portion remains in the state of motion due to the inertia of motion. This is the reason for the passenger to lean forward when the bus stops suddenly.

**S20. Ans.(c)**

**Sol.** If a boy is sitting in a train, which is moving at a constant velocity throws a ball straight up into the air, the ball will fall into his hand.

**S21. Ans.(c)**

**Sol.** A person is hurt on kicking a stone due to reaction. Here Newton third law of motion is applied which states that every action has equal and opposite reaction.

**S22. Ans.(c)**

**Sol.** For a body moving with non-uniform acceleration, the velocity-time graph is nonlinear.



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**S23. Ans.(c)**

**Sol.** A parachute descends slowly because it has a larger surface area and air resistance is more.

**S24. Ans.(b)**

**Sol.** A pendulum clock runs faster in winter because in winter the length of the pendulum or the swing become smaller due to contraction and the clock begin to run fast.

**S25. Ans.(d)**

**Sol.** Oil spreads on water surface because the surface tension of oil is less than water.

**S26. Ans.(a)**

**Sol.** At -40 degrees, the numerical values on Celsius and Fahrenheit scales become equal.

**S27. Ans.(c)**

**Sol.** Sublimation is the phase transition of a substance directly from the solid to the without passing through the intermediate liquid phase.

**S28. Ans.(a)**

**Sol.** When a ball is thrown vertically upwards Acceleration due to gravity remains constant during its motion.

**S29. Ans.(a)**

**Sol.** Heat is the amount of energy that flows spontaneously from a warmer object to a cooler one. In SI system, heat energy is measured in joules (J).

**S30. Ans.(d)**

**Sol.** The Sun and the planets move around each other with their center of mass lying at the focus of the elliptical orbits. In other words, if the orbit of a planet is an ellipse then the point at which the Sun is located called Focus.

**S31. Ans.(b)**

**Sol.** The laws which govern the motion of planets are called Kepler's law of planetary motion.

**S32. Ans.(b)**

**Sol.** Concave and convex are two classes of spherical mirrors. A concave mirror is a spherical mirror in which the reflecting surface and the center of curvature fall on the same side of the mirror. On the other hand, a convex mirror is a spherical mirror in which the reflecting surface and the center of curvature lie on the opposite sides of the mirror.

**S33. Ans.(a)**

**Sol.** Drag is a kind of frictional force exerted by fluid which opposes the motion of an object through that fluid. Drag force acts in direction opposite to the direction of motion of the object.

**S34. Ans.(a)**

**Sol.** Graphite is a very good conductor of electricity due to the mobility of the electrons in its outer valence shells.

**S35. Ans.(b)**

**Sol.** A lactometer is an instrument used to check purity of milk.

**S36. Ans.(d)**

**Sol.** Diamond is a bad conductor of electricity but good conductor of heat. Electricity is conducted in a crystal by electrons that are relatively free. But in diamond, each carbon atom is covalently bonded with four other carbon atoms and there are no free electrons.

**S37. Ans.(c)**

**Sol.** Weightlessness experienced while orbiting the earth in space ships is due to Zero gravity.

**S38. Ans.(a)**

**Sol.** John Logie Baird was a Scottish engineer, innovator, one of the inventors of the mechanical television, demonstrating the first working television system on 26 January 1926.

**S39. Ans.(a)**

**Sol.** An electroscope is an early scientific instrument that is used to detect the presence and magnitude of electric charge on a body. It was the first electrical measuring instrument. The first electroscope, a pivoted needle called the versorium, was invented by British physician William Gilbert around 1600.

**S40. Ans.(d)**

**Sol.** Wavelength of red colour is largest and violet colour has the shortest wavelength.

**S41. Ans.(b)**

**Sol.** On September 10, 1846, Elias Howe was granted a US patent for his invention of the sewing machine.

**S42. Ans.(a)**

**Sol.** The impulse-momentum theorem states that the change in momentum of an object equals the impulse applied to it.

**S43. Ans.(a)**

**Sol.** ISRO built India's first satellite known as Aryabhata.

**S44. Ans.(c)**

**Sol.** The cooling by a desert cooler is based on evaporative cooling. These coolers are also known as swamp coolers.

**S45. Ans.(b)**

**Sol.** Most of the air conditioner uses compressed gas, which can cool the room or other places.

**S46. Ans.(d)**

**Sol.** If salt is added to the water then the boiling point of water will increase. This happens as the boiling point is the temperature at which the vapor pressure of solvent becomes equal to the external atmospheric pressure. Similarly it also decreases the freezing point, which in turn will interfere with the frozen solution's crystal structure. That means the temperature will have to be colder to overcome it and freeze the mixture anyway.

**S47. Ans.(d)**

**Sol.** Graphite is soft and slippery because there are only weak inter molecular forces between its layers. Graphite is a good conductor of heat and electricity.

**S48. Ans.(c)**

**Sol.** This is because of a phenomenon is known as winter stratification in water bodies. In the winter season, the water at the top layer of water bodies will be ice cold (0°C) and are gradually frozen. But still, the bottom layers will have liquid water and maintain a temperature (4°C) which supports the life there. Thus, fishes and other aquatic animals are saved from the frozen top layer of water.

**S49. Ans.(b)**

**Sol.** The color of light is determined by its wavelength. Different colors have different wavelengths. The wavelength of red colour is largest and violet colour has shortest wavelength.

**S50. Ans.(b)**

**Sol.** Many of the nuclear reactors use graphite as a moderator. Graphite is not as effective as heavy water, but it is cheaper and it also has a low degree of neutron capture like heavy water.

**S51. Ans.(a)**

**Sol.** When a beam pass of parallel light rays is incident on a smooth and plane surface, the reflected rays will also be parallel. This type of reflection is called Regular Reflection.

**S52. Ans.(d)**

**Sol.** Speed is the distance travelled by object in a certain interval of time. Speed is not dependent on direction hence it is a scalar quantity. While Displacement, Momentum and Torque has both magnitude and direction, so they are vector quantity.

**S53. Ans.(a)**

**Sol.** The temperature at which a liquid freezes is called the Freezing Point. The freezing point of water is 32°F.

**S54. Ans.(b)**

**Sol.** Newton's first law is other name of Galileo's law of Falling bodies. According to Law of Fall "The distance travelled by falling body is directly proportional to the square of the time it takes to fall". This latter claim states that a body in motion will continue its motion so long as no factor disturbs that motion. This principle is called the principle of inertia which is basis of Newton's first law.

**S55. Ans.(d)**

**Sol.** A transistor is a semiconductor device used as an amplifying device.



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**S56. Ans.(a)**

**Sol.** The unit of measurement of Noise is Decibel.

**S57. Ans.(c)**

**Sol.** Total internal reflection is responsible for the glittering of air bubble rising through water.

**S58. Ans.(c)**

**Sol.** In an optical fibre the signal is transmitted due to total internal reflection.

**S59. Ans.(a)**

**Sol.** Visible light has the lowest frequency among the following electromagnetic radiations.

**S60. Ans.(b)**

**Sol.** The Theory of relativity is postulated by Albert Einstein.

**S61. Ans.(d)**

**Sol.** Angular Velocity is same on every point on a rotating body.

**S62. Ans.(c)**

**Sol.** Trajectory is the path followed by a projectile flying or an object moving under the action of given forces, a curve or surface cutting a family.

**S63. Ans.(b)**

**Sol.** Adolf Gaston Eugen Fick was credited with invention of the Contact Lens.

**S64. Ans.(c)**

**Sol.** Electrons move around the nucleus in orbital motion.

**S65. Ans.(b)**

**Sol.** Sphygmomanometers is an instrument for measuring blood pressure, particularly in arteries. The two types of sphygmomanometers are a mercury column and a gauge with a dial face.

**S66. Ans.(b)**

**Sol.** The reflecting telescope invented by Sir Isaac Newton in 1671.

**S67. Ans.(b)**

**Sol.** We know that-

$$\begin{aligned} \text{Number of unit} &= \text{kilowatt hour} = \text{watt} \times \text{hour} / 1000 \\ &= (60 \times 30 \times 5) / 1000 = 9 \text{ unit.} \end{aligned}$$

**S68. Ans.(b)**

**Sol.** According to a report of Department of Atomic Energy in India, there are approximately 10.70 million tons of monazite, which contains 9,63,000 tons of Thorium Oxide (ThO<sub>2</sub>). India is one country that has an abundance of thorium. Andhra Pradesh has 35% of thorium reserve of India.

**S69. Ans.(b)**

**Sol.** Kalpakkam is a small town in Tamilnadu. Narora is located on the bank of river Ganga in district Bulandshahar, Uttar Pradesh. Kakrapara atomic power station is a nuclear power station in India, which lies in the state of Gujarat. Trombay is a northeastern suburb in Mumbai, India. It is famous for Bhabha Atomic Research Centre (BARC).

**S70. Ans.(b)**

**Sol.** A pyrometer is a type of remote sensing thermometer used to measure the temperature of a surface. In the modern usage, it is a device that from a distance determines the temperature of a surface from the spectrum of the thermal radiation it emits, a process known as pyrometry.

**S71. Ans.(a)**

**Sol.** Refrigerator temperatures do not destroy pathogenic or spoilage microorganisms. The lower temperature slows the growth of microorganisms already in the food. According to international standards, the recommended temperature of the refrigerator is 36°F to 38°F (1.7°C to 3.3°C). Thus option (a) is correct.

**S72. Ans.(d)**

**Sol.** A periscope is an instrument for observation over, around or through an object, obstacle or condition that prevents direct line-of-sight observation from an observer's current position

**S73. Ans.(a)**

**Sol.** The trapped steam increases the atmospheric pressure inside the cooker by 15 pounds per square inch (psi), or 15 pounds above normal sea-level pressure. At that pressure, the boiling point of water is increased from 212°F to 250°F. This higher temperature cooks food faster.

**S74. Ans.(c)**

**Sol.** Electric motor is a device which converts electrical energy into mechanical energy. Electric motors involve rotating coils of wire which are driven by the magnetic force exerted by a magnetic field or an electric current.

**S75. Ans.(a)**

**Sol.** Electric motors operating at low voltage tend to burn out because they draw more current which is inversely proportional to the voltage.

**S76. Ans.(a)**

**Sol.** Decibel(dB) is the SI unit of intensity of sound.

**S77. Ans.(a)**

**Sol.** When blue and green colour combine, the result is cyan.

**S78. Ans.(b)**

**Sol.** SI unit of power is watts. A watt is the power that it takes to do one joule of work in one second.



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**S79. Ans.(d)**

**Sol.** The neon gas is used in discharge lamps, tubes and in fluorescent bulbs.

**S80. Ans.(c)**

**Sol.** The distance-time graph for the motion of an object moving with a constant speed is a Straight Line.

**S81. Ans.(a)**

**Sol.** If the force applied on the object is in the direction of its motion, the speed of the object increases.

**S82. Ans.(b)**

**Sol.** Blood pressure is measured by instrument called sphygmomanometer also called as blood pressure meter, it is used to measure the pressure of blood in Arteries.

**S83. Ans.(d)**

**Sol.** The reverse effect of X-ray emission is Photo-electric effect.

**S84. Ans.(d)**

**Sol.** Solar panels are those devices which are used to absorb the sun's rays and convert them into electricity or heat. A solar panel is actually a collection of solar (or photovoltaic) cells.

**S85. Ans.(a)**

**Sol.** Cosmology is the study of the origin, evolution of the universe.

**S86. Ans.(a)**

**Sol.** When a ball is thrown upwards the acceleration due to gravity remains constant throughout. It comes to rest for a moment at the highest point of motion just before returning back to earth.

**S87. Ans.(a)**

**Sol.** The SI unit of intensity, which includes sound intensity, is the watt per square meter ( $W/m^2$ ).

**S88. Ans.(c)**

**Sol.** The glass or steel which is used in thermos bottle is coated with a silver layer to keep drinks at the same temperature for some time.

**S89. Ans.(a)**

**Sol.** The atmosphere exerts enormous pressure on us but we do not feel it, because our blood exerts pressure slightly more than that of the atmosphere. We feel this pressure in water because the pressure underwater is greater than our normal blood pressure.

**S90. Ans.(b)**

**Sol.** The sensation of weightlessness in a spacecraft in an orbit is due to the acceleration in the orbit which is equal to the acceleration due to gravity outside.

**S91. Ans.(c)**

**Sol.** It is easier to carry two buckets of water in one hand each, than to carry only one in one hand because centre of gravity and centre of equilibrium fall within the feet.

**S92. Ans.(b)**

**Sol.** Uranium is used as fuel in nuclear reactors.

**S93. Ans.(d)**

**Sol.** Tungsten is used for the manufacture of the filament of an electric bulb due to its high melting point of 3422 °C.

**S94. Ans.(a)**

**Sol.** A charged particle moving without acceleration produces an electric as well as a magnetic field.

**S95. Ans.(c)**

**Sol.** Kerosene oil rising in the wick of the stove is due to the surface tension of oil. The wick of the lamp has many holes which act as capillaries. So kerosene keeps on rising in the capillaries.

**S96. Ans.(d)**

**Sol.** The mirage is caused by the Total internal reflection of light at layers of air of different densities.

**S97. Ans.(a)**

**Sol.** The wavelength of red colour is highest while of violet colour is lowest. Dispersion is inverse to wavelength so it is seen more clear. That's why the red colour is used in traffic.

**S98. Ans.(a)**

**Sol.** As we know that the speed of sound is different for different types of medium. In general, sound travels faster in liquids than gases and faster in solids than in liquids.

**S99. Ans.(b)**

**Sol.** The repetition of sound produced due to the reflection from a large surface like wall, hill or mountain is called echo. Minimum distance between source of sound and reflecting surface be 17 meter so that an echo can be heard.

**S100. Ans.(d)**

**Sol.** Sound waves are divided into three categories that cover different frequency range; Audible waves (20 Hz- 20,000 Hz), Infrasonic waves (<20 Hz) and Ultrasonic waves (>20,000 Hz). Ultrasonic waves are used to destroy insects, clean clothes by removing dust, treat diseases, control automatic doors, detection of aircraft and submarine, determination of depth of sea etc.

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