Q. 1) Consider the following pairs

Name of the Quantity	SI Unit
1. Time	Hour
2. Electric current	Ampere
3. Length	Meter
4. Temperature	Kelvin

How many given pairs are correctly matched?

a) One pair
b) Two pairs
c) Three pairs
d) Four pairs

Q.1) Solution: (c)

Explanation:

The International System of Units is a global standard for expressing the magnitudes or quantities of important natural phenomena. Also referred to as the metric system, the System of Units is commonly abbreviated as SI, which comes from the original French name, Système international d'unités.

Name of the Quantity	SI Unit
1. Time	**Second (s)**
2. Electric current	**Ampere (A)**

3. Length	**Meter (m)**
4. Temperature	**Kelvin (K)**
5. Mass	Kilogram (kg)
6. Amount of substance	Mole (mol)
7. Luminous Intensity	Candela (cd)

Hence option c is correct.

Q. 2) Consider the following statements

1. A scalar quantity has both magnitude and direction.
2. A scalar quantity can be three-dimensional.
3. Mass, energy, and length are examples of scalar quantities.

Which of the following statements is correct?

a) 1 and 3
b) 2 only
c) 1 and 3
d) 3 only

Q.2) Solution: (d)

Explanation:

- **Scalar quantities** are the quantities that only have a magnitude or size associated with them.
- Vector quantities are those physical quantities that have both magnitude and direction like displacement, velocity, acceleration, force, mass, etc. **Hence statement 1 is incorrect.**

- Scalar quantities can be expressed completely with a single number.
- **Every scalar quantity is one-dimensional.**
- For doing operations on scalar quantities, the usual rules of algebra work. These quantities can be added and subtracted in the same way numbers are added and subtracted. But only numbers with the same measuring unit can use the process for a scalar quantity. **Hence statement 2 is incorrect.**
- Some examples of scalar quantities are – the mass of an object, the distance between two points, Energy etc. **Hence statement 3 is correct.**

Q. 3) Consider the following statements

1. Velocity is the rate at which a particular object changes its position in a certain direction.
2. Speed is the amount of distance covered by an object over a specific period.
3. Velocity is a scalar quantity whereas speed is a vector quantity.

Choose the correct code:

a) 1 and 2
b) 2 and 3
c) 1 and 3
d) 1, 2 and 3

Q.3) Solution: (a)

Explanation:

- ✓ Velocity is the rate at which a particular object changes its position in a certain direction.
- ✓ At its core, velocity tells the difference between an object's final and initial positions. Velocity helps us to determine how quickly a person or an object will reach its destination from a given location. **Hence statement 1 is correct.**
- ✓ Speed is the amount of distance covered by an object over a specific period.
- ✓ It is helpful in estimating how fast the object is moving.

- ✓ A change in speed tells us two things: either the object's speed has gotten very fast or slow.
- ✓ An increase in the speed of an object is called acceleration. On the other hand, if the speed decreases it is known as deceleration. If the object is not moving at all the speed is zero. **Hence statement 2 is correct.**
- ✓ Velocity is a vector quantity whereas speed is a scalar quantity.
- ✓ In order to find velocity, we need both magnitude and direction. **Hence velocity is a vector quantity.**
- ✓ **Speed doesn't take the direction of the object into consideration it is called a scalar quantity**. **Hence statement 3 is incorrect.**

Q. 4) Consider the following statements

1. A ball rolling on the ground.
2. Pushing a shopping cart.
3. Resting against a tree.

Which of the given above is an example of Newton's second law of motion?

a) 1 only
b) 2 and 3
c) 2 only
d) 1 and 3

Q.4) Solution: (c)

Explanation:

- Newton's laws of motion are three basic laws of classical mechanics that describe the relationship between the motion of an object and the forces acting on it. These laws can be paraphrased as follows:
  1. A body remains at rest, or in motion at a constant speed in a straight line, unless acted upon by a force.

2. When a body is acted upon by a force, the time rate of change of its momentum equals the force.
3. If two bodies exert forces on each other, these forces have the same magnitude but opposite directions

✓ **A ball rolling on the ground is an example of Newton's first law of motion.** As per law, a ball rolling on the ground is prone to maintain its state of motion till infinity if no external force will be applied to it; hence the frictional force acting on the ball from the external will helps to break the motion of that ball & brings it to its rest position. **Hence statement 1 is incorrect.**

- Newton's second law of motion is a quantitative illustration of the changes in the body that refers to the general situation when there is a net external force acting on the body. It relates the net external force to the acceleration of the body.

✓ **Pushing a shopping cart** is an example of Newton's second law of motion. There is a difference between pushing an empty cart which is easy to push and pushing a loaded cart which is difficult to push. This happens because of the relationship between the mass of the object (mass of cart), the force applied to it and the acceleration produced. The mass has inversely proportional to acceleration, so that's why the loaded cart has a slower pace than the empty cart. **Hence statement 2 is correct.**

- Newton's third law of motion states that "To every action, there is always an equal and opposite reaction".It states that when two bodies interact with each other, they have to apply forces to each other that are equal in magnitude and opposite in direction.

✓ **Resting against a tree** is an example of Newton's third law of motion. Whenever we rest against a tree we get a reactive force from the tree to support us. In that example, the active and reactive forces are balanced in nature because both forces are applied for balancing the person. **Hence statement 3 is incorrect.**

Q. 5) Consider the following statements

1. The force directed towards the center when an object is moving in a circular path is called centrifugal force.

2. The electromagnetic force between the protons in the nucleus is an example of centripetal force.

Choose the correct code:

a) 1 only
b) 2 only
c) Both 1 and 2
d) Neither 1 nor 2

Q.5) Solution: (b)

Explanation:

- ✓ The force directed towards the center when an object is moving in a circular path is called centripetal force. The force is directed radially toward the center of the circle.
- ✓ When a body moves in a circular path, in the frame where the body is, the force that acts radially outward is called centrifugal force. It is also termed a pseudo or fictitious force. It comes into play only in non-inertial frames–ones in which Newton's laws are not obeyed. **Hence statement 1 is incorrect.**
- ✓ The electromagnetic force between the protons in the nucleus, the electrons revolving in orbits around the nucleus, and the movement of a car on a circular track are examples of centripetal force. **Hence statement 2 is correct.**

Q. 6) Consider the following statements

1. Kinetic energy is a form of energy possessed by an object due to its motion.
2. Energy in the electrical charges and gravitational energy are examples of kinetic energy.
3. Kinetic energy tends to be zero when the object is in the rest position.

Choose the correct code:

a) 1 and 2
b) 2 and 3
c) 1 and 3

d) 1, 2 and 3

Q.6) Solution: (c)

Explanation:

- Kinetic energy is a form of energy possessed by an object due to its motion. It applies to all the objects which are in motion. If we want to explain kinetic energy in terms of work, then it can be stated as the work done to accelerate the object to move at a certain velocity.
- ✓ Kinetic energy is directly proportional to the body's mass and the square of the velocity with which the body is moving. **Hence statement 1 is correct.**
- Kinetic energy examples include energy possessed by a moving bus, a ball thrown in the air, and a swing doing to and fro motion.
- Potential energy is defined as the stored form of energy.
- When the object starts moving, potential energy gets converted into kinetic energy. Thus, for an object to move, it must have potential energy.
- It is energy present in the object by virtue of its position with respect to other bodies.
- **Energy in the electrical charges and gravitational energy are examples of potential energy.**
- ✓ Potential energy depends on the mass of the object. **Hence statement 2 is incorrect.**
- ✓ Since Kinetic energy is a form of energy possessed by an object due to its motion, it tends to be zero when the object is in the rest position. **Hence statement 3 is correct.**

Q. 7) Consider the following statements

1. Kepler's First Law of Planetary Motion states that the orbit of every planet around the sun is an ellipse.
2. Kepler's laws help in understanding and predicting the motions of natural and artificial satellites.

Choose the correct code:

a) 1 only
b) 2 only
c) Both 1 and 2
d) Neither 1 nor 2

Q.7) Solution: (c)

Explanation:

- Kepler's First Law of Planetary Motion states that the orbit of every planet around the sun is an ellipse. The centre of the sun is found at one of the foci in the planet's elliptical orbit. The sun is in a single point of focus, and all the planets travel in an elliptical orbit.
- ✓ This means that the distance between the sun and the planet changes as the planets move. The point at which a planet is closest to the sun is called the perihelion. The point at which the planet is found at its furthest distance from the sun is called the aphelion. **Hence statement 1 is correct.**
- Kepler's Second Law of Planetary Motion states that the imaginary line that joins both the planet and sun sweeps an equal area of space in equal intervals of time. Eventually, the planets do not move at a constant speed along the orbits as believed to be. Instead, their speed varies with the equal area of space swept by the planet in a particular time limit.
- The highest speed is observed at the perihelion, while the planet moves slower at the aphelion.
- Kepler's Third Law of Planetary Motion states that the cube of a planet's semi-major axis is directly proportional to the square of its time period of revolution around the sun in an elliptical orbit.
- Kepler's theories were crucial in gaining a better grasp of the dynamics of our solar system, as well as serving as a springboard for newer models that more properly approximate our planetary orbits.

- ✓ Kepler's laws are applied in understanding and predicting the motions of natural and artificial satellites, along with those of star systems and extrasolar planets. **Hence statement 2 is correct.**

Q. 8) Consider the following statements

1. The fluid should have less density than the object.
2. The weight of the object must be equal to the upthrust force of the fluid.

Which of the given above is correct regarding the conditions for an object to float in fluid?

a) 1 only
b) 2 only
c) Both 1 and 2
d) Neither 1 nor 2

Q.8) Solution: (b)

Explanation:

- When a body floats with its volume partially above the liquid surface, the volume of the liquid displaced by the body is equal to the volume of the submerged portion of the body. Since the body is in equilibrium, the force of buoyancy acting on the body must be equal to its weight. This is known as the law of floatation.
- The conditions for an object to float in fluid:

✓ The fluid should have more density than the object. **Hence statement 1 is incorrect.**

✓ The weight of the object must be equal to the upthrust force of the fluid. **Hence statement 2 is correct.**

Q. 9) Consider the following statements

1. Mechanical waves can be produced or propagated only in a material medium.
2. Electromagnetic waves require no material medium for their production and propagation.
3. Visible light and ultra-violet light are examples of mechanical waves.

Choose the correct code:

a) 1 and 2
b) 2 and 3
c) 1 and 3
d) 1, 2 and 3

Q.9) Solution: (a)

Explanation:

- Wave is a form of disturbance that travels through a material medium due to the repeated periodic motion of the particles of the medium about their mean positions without any actual transportation of matter.
- Mechanical waves can be produced or propagated only in a material medium. These waves are governed by Newton's laws of motion. **Hence statement 1 is correct.**
- **Electromagnetic waves** require no material medium for their production and propagation. i.e., they can pass through a vacuum and any other material medium. **Hence statement 2 is correct.**
- Visible light and ultra-violet light are examples of electromagnetic waves.
- Waves on the water's surface, waves on strings, sound waves, etc are examples of mechanical waves. **Hence statement 3 is incorrect.**

Q. 10) Consider the following statements

1. The distance travelled by the wave during one complete oscillation is called the frequency of the wave.

2. The number of oscillations made by the wave in one second is called the wavelength of the wave.
3. The time taken by the wave to complete one oscillation is called the time period of the wave.
4. The maximum displacement of the wave from its mean or equilibrium position is called the amplitude of the wave.

Choose the correct code:

a) One statement is correct
b) Two statements are correct
c) Three statements are correct
d) Four statements are correct

Q.10) Solution: (b)

Explanation:

- The distance travelled by the wave during one complete oscillation is called the wavelength of the wave.
- Wavelength is the distance between identical points (adjacent crests) in the adjacent cycles of a waveform signal propagated in space or along a wire. In wireless systems, this length is usually specified in meters (m), centimeters (cm), or millimeters (mm). In the case of infrared (IR), visible light, ultraviolet (UV), and gamma radiation (γ), the wavelength is more often specified in nanometers (nm).
- Wavelength is inversely related to frequency, which refers to the number of wave cycles per second. The higher the frequency of the signal, the shorter the wavelength. **Hence statement 1 is incorrect.**
- The number of oscillations made by the wave in one second is called the frequency of the wave.
- It is the number of waves that pass a fixed point in unit time; also, the number of cycles or vibrations undergone during one unit of time by a body in periodic motion. A body in

periodic motion is said to have undergone one cycle or one vibration after passing through a series of events or positions and returning to its original state. **Hence statement 2 is incorrect.**

- The time taken by the wave to complete one oscillation is called the time period of the wave. This is the amount of time it takes for a complete wave to occur. **Hence statement 3 is correct.**
- The maximum displacement of the wave from its mean or equilibrium position is called the amplitude of the wave.
- It is equal to one-half the length of the vibration path. The amplitude of a pendulum is thus one-half the distance that the bob traverses in moving from one side to the other. Waves are generated by vibrating sources, their amplitude is proportional to the amplitude of the source. **Hence statement 4 is correct.**

Q. 11) Consider the following statements about radiation

1. It requires a medium for the transfer of heat.
2. It uses electromagnetic waves which transfer heat from one place to the other.

Choose the correct code:

a) 1 only
b) 2 only
c) Both 1 and 2
d) Neither 1 nor 2

Q.11) Solution: (b)

Explanation:

- Heat energy can be transferred from one body to the other or from one location in a body to the other. The study of the techniques and methods adopted to transfer heat energy is known as 'Heat Transfer'.

- Radiation is one form of heat transfer. It does not require any medium and can be used for the transfer of heat in a vacuum as well. **Hence statement 1 is incorrect.**
- This method uses electromagnetic waves which transfer heat from one place to the other.
- The heat and light from the sun in our solar system reach our planet using radiation only.
- Radiation is the most potent method of heat transfer. In winter when we sit near a fire we feel warm without actually touching the burning wood. This is possible by radiation only. **Hence statement 2 is correct.**

Q. 12) Consider the following statements about Stefan's law of radiation

1. Conduction is a process in which transfer of heat takes place between objects by direct contact.
2. Radition alludes to the mechanism in which heat is transmitted without any physical contact between objects.

Choose the correct code:

a) 1 only
b) 2 only
c) Both 1 and 2
d) Neither 1 nor 2

Q.12) Solution: (c)

Explanation:

- **Statement 1 is correct** because conduction is indeed a process of heat transfer that occurs due to direct contact between two objects. In this process, heat flows from the object at a higher temperature to the object at a lower temperature until both objects reach the same temperature.

- **Statement 2 is also correct** because radiation is a process of heat transfer that occurs without any physical contact between objects. In this process, heat energy is emitted by a warm object in the form of electromagnetic waves, which travel through space and can be absorbed by other objects. This is how the sun heats the Earth, for example.
- Stefan's Law of Radiation states that the rate at which an object emits radiation is proportional to the fourth power of its absolute temperature. It provides a quantitative relationship between the intensity of the radiation emitted by a blackbody and its temperature.

Q. 13) Consider the following statements about the law of thermodynamics

1. The first law deals with an energy conservation law, which indicates that energy can neither be created nor destroyed.
2. The second law states that there will always be an increase in entropy in an isolated system.
3. The Third law states that when the temperature of a system reaches absolute zero, the entropy approaches a constant value.

Choose the correct code:

a) 1 and 2
b) 2 and 3
c) 1 and 3
d) 1, 2 and 3

Q.13) Solution: (d)

Explanation:

- The first law of thermodynamics deals with an energy conservation law, which indicates that energy can neither be created nor destroyed. However, it could be possible to change from one state to another.

- Example: Plants convert light energy into chemical energy using a process called photosynthesis. Humans consume plants, transforming chemical energy into useful work such as walking, running, doing multiple tasks, etc. **Hence statement 1 is correct.**
- The second law states that there will always be an increase in entropy in an isolated system. This system can evolve towards the equilibrium condition spontaneously. Therefore, there will only be an increase in the universe's entropy, which will never reduce.
- For instance, when we take a room that has not been cleaned for months, it will only become messy and dusty every day. It will never go back to its original state (cleaned) unless someone cleans it. Once it is cleaned, the entropy of the room decreases drastically. However, the efforts to clean it have increased the entropy outside of the room. This would exceed the entropy lost. **Hence statement 2 is correct.**
- The Third law states that when the temperature of a system reaches absolute zero, the entropy approaches a constant value. This is what happens in the third law of thermodynamics.
- For example, the entropy is zero for a pure crystalline component whose temperature is absolute zero.
- Entropy is nothing but a quantity in thermodynamics, in which its value is fully dependent on the condition of a system. In simple words, entropy is the measure of the disorder or randomness of a system. **Hence statement 3 is correct.**

Q. 14) Consider the following statements

1. A concave lens is called a diverging lens whereas a convex lens is called a converging lens.
2. A concave lens has a virtual focus whereas a convex lens has a real focus.
3. A concave lens is used for people suffering from myopia.
4. A convex lens is used for people suffering from hypermetropia.

Choose the correct code:

a) 1, 2 and 3
b) 2, 3 and 4
c) 1, 3 and 4
d) 1, 2, 3 and 4

Q.14) Solution: (d)

Explanation:

- A concave lens is defined as a lens that spreads the light beam in different directions.
- A convex lens is defined as a lens wherein the rays reflected through the surface are spread in a parallel direction.
- A concave lens is called a diverging lens whereas a convex lens is called a converging lens. **Hence statement 1 is correct.**
- A concave lens has one curved surface. The surface is curved inwards.
- A convex lens has two spherical surfaces, one of which is curved outwards.
- A concave lens has a virtual focus whereas a convex lens has a real focus. **Hence statement 2 is correct .**
- A concave mirror's magnification is greater, equal to, or less than one.
- A convex mirror's magnification is less than one.
- A concave lens is used in objects like flashlights, cameras, and lasers.
- A convex lens is used in objects like magnifying glasses, microscopes, etc.
- A concave lens is used for people suffering from myopia. **Hence statement 3 is correct.**
- A convex lens is used for people suffering from hypermetropia. **Hence statement 4 is correct.**

Q. 15) Consider the following statements about Ohm's Law

1. It states that the voltage across a conductor is directly proportional to the current flowing through it.

2. It only holds true if the provided temperature and the other physical factors remain constant.

Choose the correct code:

a) 1 only
b) 2 only
c) Both 1 and 2
d) Neither 1 nor 2

Q.15) Solution: (c)

Explanation:

- Ohm's Law states that the voltage across a conductor is directly proportional to the current flowing through it, provided all physical conditions and temperatures remain constant.
- V = IR, where V is the voltage across the conductor, I is the current flowing through the conductor and R is the resistance provided by the conductor to the flow of current. **Hence statement 1 is correct.**
- It only holds true if the provided temperature and the other physical factors remain constant.
- In certain components, increasing the current raises the temperature. An example of this is the filament of a light bulb, in which the temperature rises as the current is increased. In this case, Ohm's law cannot be applied. The lightbulb filament violates Ohm's Law. **Hence statement 2 is correct.**

Q. 16) Consider the following statements

1. The alternating current can travel over longer distances whereas direct current cannot travel far.
2. In direct current, a rotating magnet along the wire is the cause of the direction of the flow of electrons.

3. The frequency of the direct current is zero whereas the frequency of alternating current is 50Hz or 60Hz.
4. The alternating current is of varying magnitude with time whereas the direct current is of constant magnitude.

Choose the correct code:

a) 2 and 3 only
b) 1, 3 and 4
c) 3 and 4 only
d) 1, 2, 3 and 4

Q.16) Solution: (b)

Explanation:

- The alternating current can travel over longer distances whereas direct current cannot travel far.
- The alternating current reverses its direction while flowing in a circuit whereas direct current flows in one direction in the circuit. **Hence statement 1 is correct.**
- In alternating current, a rotating magnet along the wire cause of the direction of the flow of electrons.
- In direct current, steady magnetism along the wire is the cause of the direction of the flow of electrons. **Hence statement 2 is incorrect.**
- The frequency of the direct current is zero whereas the frequency of alternating current is 50Hz or 60Hz. **Hence statement 3 is correct.**
- The alternating current is of varying magnitude with time whereas the direct current is of constant magnitude. **Hence statement 4 is correct.**

Q. 17) Consider the following statements about the Nobel Prize in Physics 2022

1. It was awarded to John F. Clauser, Alain Aspect, and Anton Zeilinger**.**
2. It was awarded for showcasing the interplay of disorder and fluctuations in physical systems.

Choose the correct code:

a) 1 only
b) 2 only
c) Both 1 and 2
d) Neither 1 nor 2

Q.17) Solution: (a)

Explanation:

- The **Nobel Prize in Physics 2022** was awarded to **John F. Clauser, Alain Aspect, and Anton Zeilinger**.
- The **Nobel Prize in Physics for 2022** was awarded for their work in **quantum mechanics.**
- **Quantum mechanics** is a subfield of physics that describes the **behavior of particles — atoms, electrons, photons,** and almost everything in the **molecular and sub-molecular realm. Hence statement 1 is correct.**
- In 2021, the Nobel Prize in Physics was awarded to Syukuro Manabe and Klaus Hasselmann for their research on climate models and to Giorgio Parisi for his work on the interplay of disorder and fluctuations in physical systems. **Hence statement 2 is incorrect.**

Q. 18) Consider the following statements

1. Condensation is the transformation from which water vapor converts to liquid.
2. Sublimation is the transformation of a substance from a solid state to a gaseous state without getting into the liquid state.
3. Dry ice and naphthalene are examples of condensation.

Choose the correct code:

a) 1 and 2
b) 2 and 3
c) 1 and 3
d) 1, 2 and 3

Q.18) Solution: (a)

Explanation:

- Condensation is the transformation from which water vapor converts to liquid.
- Condensation is a phenomenon in which the complete heat is removed from the substance, and from there, it converts to liquid. **Hence statement 1 is correct.**
- Sublimation is the transformation of a substance from a solid state to a gaseous state without getting into the liquid state. **Hence statement 2 is correct.**
- Dry ice and naphthalene are examples of sublimation.
- Dry ice is solid carbon dioxide. When dry ice is kept exposed to the air and the atmospheric temperature, it directly changes its solid phase to the gaseous phase, which we can see in the form of fog.
- Naphthalene is one of the organic compounds. Naphthalene is used for pesticides, and it looks like a ball. This naphthalene is seen in the washbasins in hotels, and restaurants and is of white color. **Hence statement 3 is incorrect.**

Q. 19) Consider the following

1. Pressure
2. Wavelength
3. Amplitude

Which of the above factors affects the speed of sound?

a) 1 and 2
b) 2 and 3

c) 1, 2 and 3

d) None

Q.19) Solution: (d)

Explanation:

- The speed of sound is affected by the physical properties of the medium through which it is travelling.
- Thus the speed of sound is affected by the density, temperature, humidity, and direction of the wind.
- The factors not affecting the speed of sound are pressure, amplitude, wavelength, and frequency of the sound wave. **Hence option d is correct.**

Q. 20) Consider the following statements about specific heat capacity

1. It is the amount of heat required to raise the temperature of the unit mass of a substance by 1 Kelvin.
2. SI unit of specific heat capacity is Joule per kilogram per kelvin (JKg−1K−1).

Choose the correct code:

a) 1 only

b) 2 only

c) Both 1 and 2

d) Neither 1 nor 2

Q.20) Solution: (c)

Explanation:

- Specific heat capacity is the amount of heat required to raise the temperature of the unit mass of a substance by 1 Kelvin. **Hence statement 1 is correct.**

- SI unit of specific heat capacity is Joule per kilogram per kelvin (JKg−1K−1). **Hence statement 2 is correct.**

Q.21) Consider the following statements with respect to 'Wildlife (Protection) Amendment Bill, 2022'

1. The central government can designate a Management Authority which grants export or import permit for the trade of specimens
2. The bill reduces the number of schedules from six to four removing the schedule for vermin species
3. The bill provides for any person to voluntarily surrender any captive animals or animal products for which appropriate compensation will be awarded

Choose the correct answer using the code given below

a) 1 and 2 only
b) 1 only
c) 1 and 3 only
d) All the above

Q.21) Solution (a)

Explanation:

- The **central government can designate a Management Authority, which grants export or import permits for the trade of specimens**. Anyone who trades in a scheduled specimen must inform the appropriate authority of the transaction's specifics. **Statement 1 is correct**
- The amended bill **reduces the total number of schedules to four by eliminating the schedule for vermin species and reducing the number of schedules for specially protected animals to two**. It also inserts a new schedule for specimens listed under CITES. **Statement 2 is correct**

- The bill provides **for any person to voluntarily surrender any captive animals or animal products for which no compensation** will be awarded and the items will become the property of the state government. **Statement 3 is incorrect**

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Q.22) Consider the following statements with respect to 'end-to-end encryption technology'

1. The process uses an algorithm that transforms standard text into an unreadable format, which can only be unscrambled by those with the encryption keys
2. The technology also protects metadata which includes information like when a file was created, the date when a message is sent and the endpoints between which data was shared

Select the correct statement(s)

a) 1 only
b) 2 only
c) Both 1 and 2
d) Neither 1 nor 2

Q.22) Solution (d)

Explanation:

- End-to-end encryption is a communication process that encrypts data being shared between two devices, preventing 3rd parties (cloud service providers, internet service providers (ISPs), and cybercriminals) from accessing data while it is being transferred. Its **process uses an algorithm that transforms standard text into an unreadable format, which can only be unscrambled by those with the decryption keys**. **Statement 1 is correct**

- The technology **does not protect metadata which includes information like when a file was created, the date when a message is sent and the endpoints between which data was shared**. **Statement 2 is incorrect**

Source: CLICK HERE

Q.23) 'Artemis Mission' recently seen in news aims to

a) Further the understanding of the exo-planets
b) Study the origin of universe
c) Facilitate human mission to mars
d) Developing a planetary defense against Near-Earth objects

Q.23) Solution (c)

Explanation:

The Artemis program is a **robotic and human Moon exploration** program led by the United States' National Aeronautics and Space Administration (NASA) along with three partner agencies: European Space Agency (ESA), Japan Aerospace Exploration Agency (JAXA), and Canadian Space Agency (CSA). The Artemis program intends to reestablish a human presence on the Moon for the first time since the Apollo 17 mission in 1972. The major components of the program are the Space Launch System (SLS), Orion spacecraft, Lunar Gateway space station and the commercial Human Landing Systems. **The program's long-term goal is to establish a permanent base camp on the Moon and facilitate human missions to Mars.**

Source: CLICK HERE

Q.24) Consider the following statements with respect to 'Sri Aurobindo Ghosh'

1. He became a leading figure in the freedom movement and used to write articles for the English newspaper Bande Mataram and started the weekly English journal titled Dharma

2. He was one of the founders of the youth club Anushilan Samiti and was charged in the Manicktolla bomb conspiracy case
3. The Life Divine, Synthesis of Yoga and Savitri are some of his main literary works

Choose the correct answer using the code given below

a) 1 and 2 only
b) 2 and 3 only
c) 1, 2 and 3
d) 1 and 3 only

Q.24) Solution (b)

Explanation:

- He **became a leading figure in the freedom movement and used to write articles for the English newspaper Bande Mataram**. After his acquittal in the Alipore Bomb case, Sri Aurobindo launched Karmayogin, a weekly English journal conceived as 'A Weekly Review of National Religion, Literature, Science, Philosophy. **Sri Aurobindo also launched Dharma, a weekly Bengali journal**. **Statement 1 is incorrect**
- He was one of the founders of the **youth club Anushilan Samiti which protested against the atrocities of the British government and was charged in the Alipore Bomb Case (1906-1910) and was sentenced to jail**. It is colloquially referred to as the Alipore Bomb Case, the Muraripukur conspiracy, or the Manicktolla bomb conspiracy. **Statement 2 is correct**
- His major works include: **Essays on the Gita (1922), The Life Divine (1939) Collected Poems and Plays (1942), The Synthesis of Yoga (1948), The Human Cycle (1949), The Ideal of Human Unity (1949), Savitri: A Legend and a Symbol (1950), On the Veda (1956**). **Statement 3 is correct**

Source: CLICK HERE

Q.25) Consider the following statements with respect to 'India Internet Governance Forum (IGF)'

1. It has been constituted in conformance to the Tunis Agenda of the UN-based Internet Governance forum (IGF)
2. Theme of this year's forum is 'last mile service delivery using internet for a digital Bharat'

Select the correct statement(s)

a) 1 only
b) 2 only
c) Both 1 and 2
d) Neither 1 nor 2

Q.25) Solution (a)

Explanation:

- The India Internet Government Forum is an initiative associated with the UN Internet Governance Forum (UN-IGF). The Internet Governance Forum (IGF) is a multi-stakeholder platform bringing representatives together from various groups, all at par to discuss public policy issues related to the Internet. **India Internet Governance Forum(IIGF) has been constituted in conformance to IGF-Paragraph 72 of the Tunis Agenda of the UN-based Internet Governance forum (IGF). Statement 1 is correct**
- **Theme of IIGF 2022: 'Leveraging Techade for Empowering Bharat'. India hosted it for 1st time last year (2021**). **Statement 2 is incorrect**

Source: CLICK HERE

Q.26) Consider the following relationships among members of a family of six persons A, B, C, I, J and K. J is son of I, who is not the mother of J; B is brother of I; K and I are a married couple; C is daughter of K, who is sister of A.

How many female members are there in the family?

a) Two

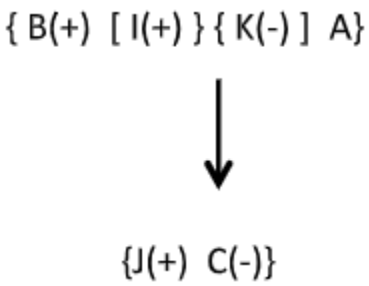
b) Three

c) Four

d) Can't be determined

Q.26) Solution (d)

Explanation:



The number of female members can't be determined because the gender of A is not specified.

Hence, the option d is correct.

Q.27) B and C are siblings. M has two children and he is son of E, who is father-in-law of H. H has only one son. C is not granddaughter of E. How is B related to E?

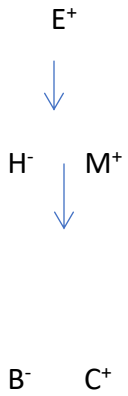
a) Grand daughter

b) Son

c) Daughter

d) Cannot be determined

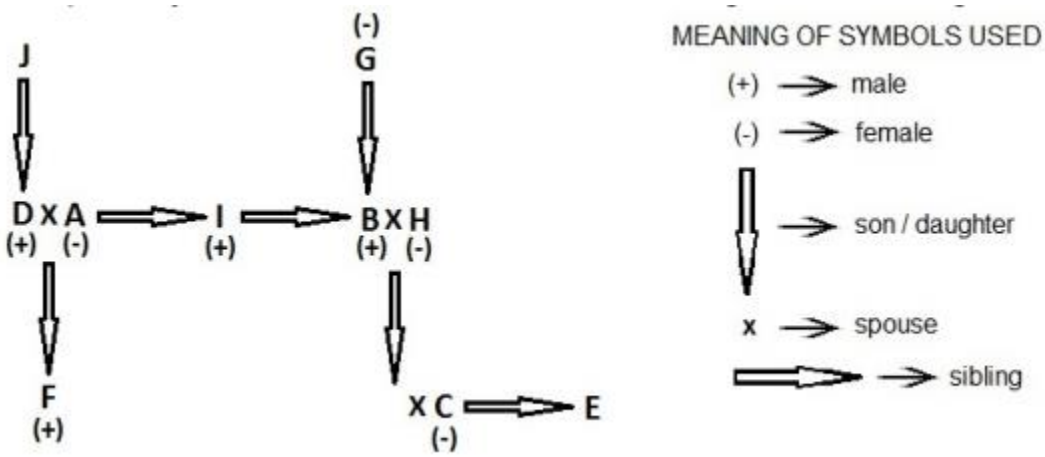
Q.27) Solution (a)



Q.28) There are ten members A, B, C, D, E, F, G, H, I, and J in the family. There are three generations of the family. There is an equal number of male and female. A is the daughter – in - law of J. B's brother I have only one sister A. H and B are the married couple. H is the mother – in – law of C. G is the mother of B. D is the son in law of G. C is the sister of E. F is the only son of D. If Y is the daughter of I ; then how is Y related to G?

a) Sister
b) Grand-daughter
c) Sister – in – law
d) Cousin

Q.28) Solution (b)



Explanation: Here, if Y is the daughter of I, then Y will be the grand - daughter of G

Q.29) Rakesh said to Akshay, "That boy playing with the football is the younger of the two brothers of the daughter of my father's wife." How is the boy playing football related to Rakesh?

a) Son
b) Brother
c) Cousin
d) Brother-in-law

Q.29) Solution (b)

Explanation:

Father's wife — Mother; Mother's daughter — Sister; Sister's younger brother — My younger brother. So, the boy is Rakesh's brother.

Read the following passage and answer the questions that follow each passage. Your answer to these questions should be based on passage only.

Organized retail has fuelled new growth categories-like liquid hand wash, breakfast cereals and pet foods in the consumer goods industry, accounting for almost 50% of their sales, said data from market search firm Nielsen. The figures showed some of these new categories got more than 40% of their business from modern retail outlets. The data also suggests how products in these categories reach the neighbourhood kirana stores after they have established themselves in modern trade. While grocers continue to be an important channel, for the new and evolving categories we saw an increased presence of high-end products in modern trade. For example, premium products in laundry detergents, dishwashing, car air fresheners and surface care increased in availability through this format as these products are aimed at affluent consumers who are more likely to ship in supermarket/hypermarket outlets and who are willing to pay more for specialized products.

Q.30) The new growth category products

a) account for less than 20% of sales in organized retail
b) reach first the neighbourhood Kirana shop and then the modern retail outlets
c) reach all the outlets almost at the same time
d) first become popular in modern trade outlets before reaching Kirana shops

Q.30) Solution (d)

Explanation:

Refer to "The data also suggests how products in these categories reach the neighbourhood kirana stores after they have established themselves in modern trade.."

Hence, option d is the correct answer.