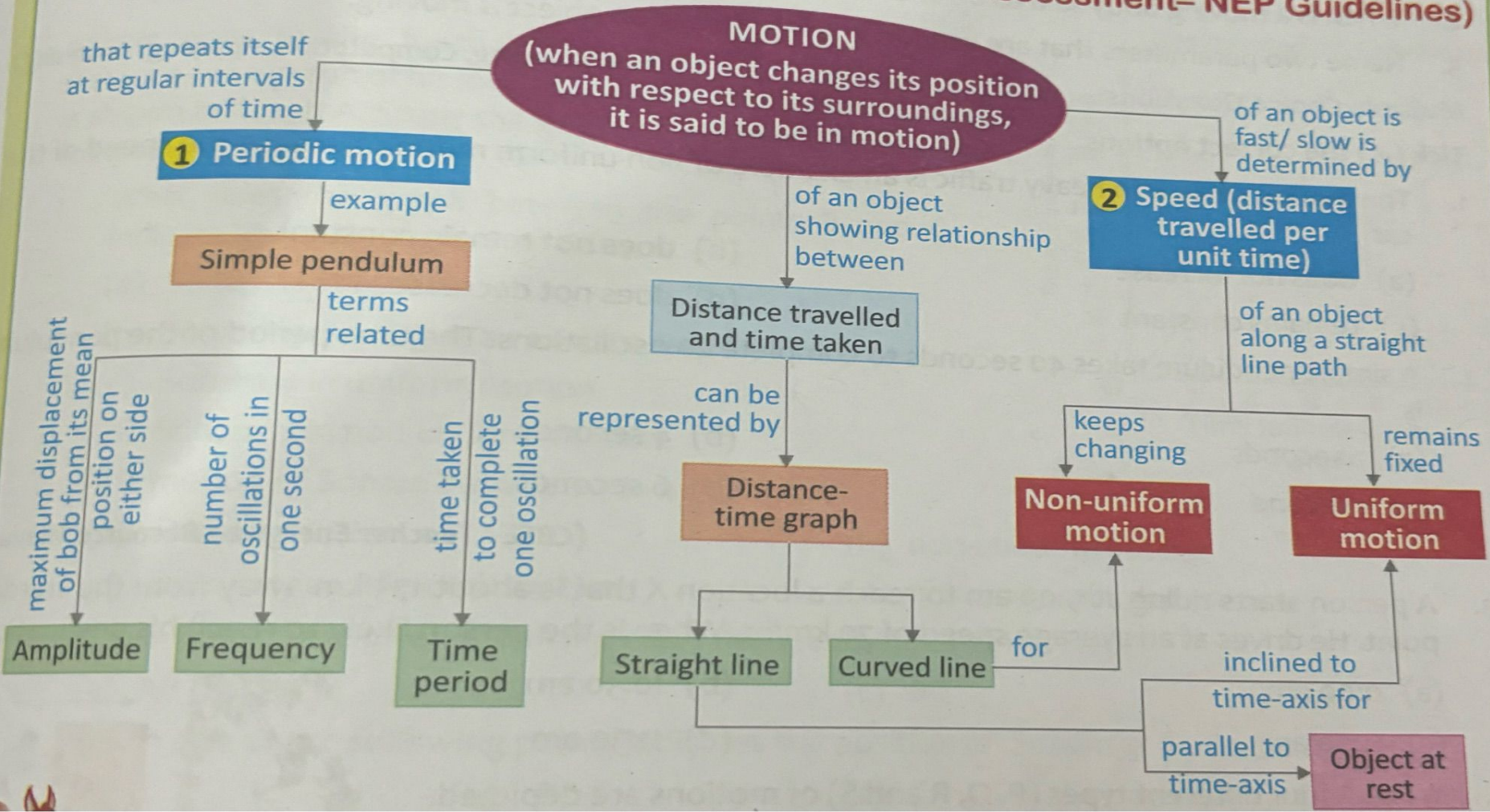
(Self/Peer Assessment– NEP Guidelines)



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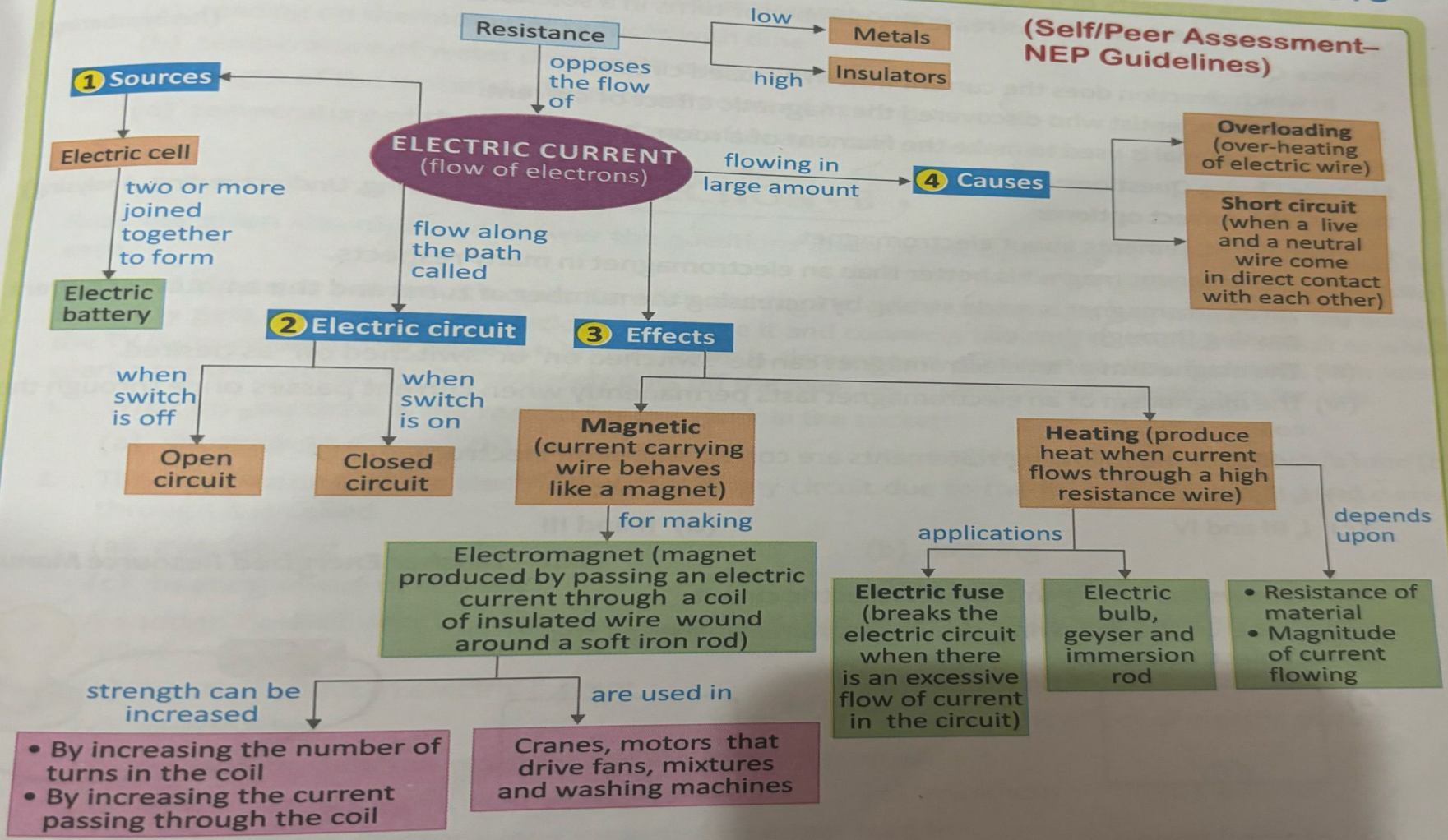
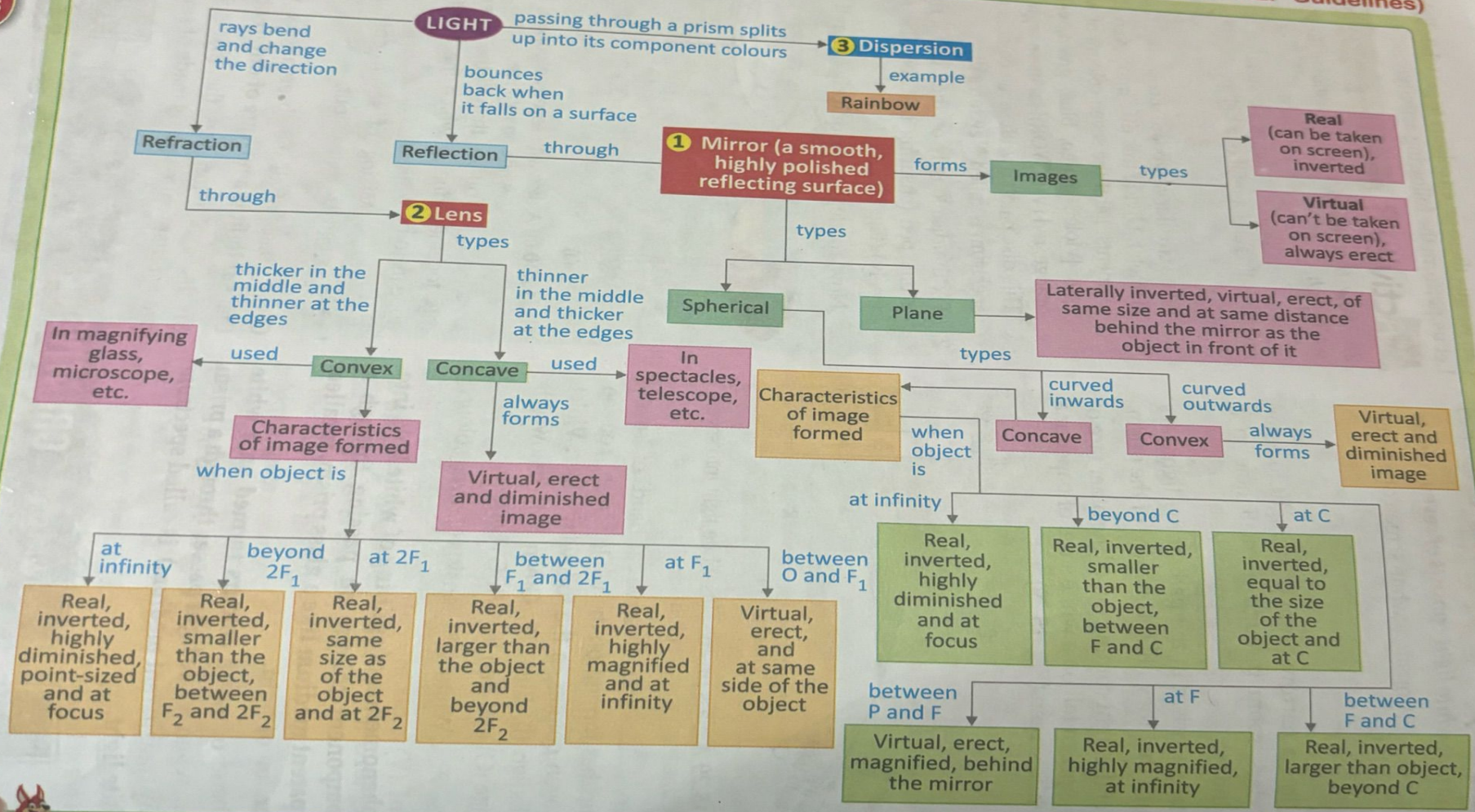



LIGHT
rays bend and change the direction
Refraction
through
2 Lens
types
thicker in the middle and thinner at the edges
Convex
used
In magnifying glass, microscope, etc.
Characteristics of image formed
when object is
at infinity
Real, inverted, highly diminished, point-sized and at focus
beyond $2F_1$
Real, inverted, smaller than the object, between F_2 and $2F_2$
at $2F_1$
Real, inverted, same size as of the object and at $2F_2$
between F_1 and $2F_1$
Real, inverted, larger than the object and beyond $2F_2$
at F_1
Real, inverted, highly magnified and at infinity
between O and F_1
Virtual, erect, and at same side of the object
thinner in the middle and thicker at the edges
Concave
used
In spectacles, telescope, etc.
always forms
Virtual, erect and diminished image
passing through a prism splits up into its component colours
3 Dispersion
example
Rainbow
bounces back when it falls on a surface
Reflection
through
1 Mirror (a smooth, highly polished reflecting surface)
forms
Images
types
Real (can be taken on screen), inverted
Virtual (can't be taken on screen), always erect
types
Spherical
Plane
Laterally inverted, virtual, erect, of same size and at same distance behind the mirror as the object in front of it
types
Characteristics of image formed
when object is
curved inwards
Concave
curved outwards
Convex
always forms
Virtual, erect and diminished image
at infinity
Real, inverted, highly diminished and at focus
beyond C
Real, inverted, smaller than the object, between F and C
at C
Real, inverted, equal to the size of the object and at C
between P and F
Virtual, erect, magnified, behind the mirror
at F
Real, inverted, highly magnified, at infinity
between F and C
Real, inverted, larger than object, beyond C

. In the context of wearable technology, which of the following tasks is/are accomplished by wearable devices?

1. Location identification of a person

2. Sleep monitoring of a person

3. Assisting the hearing impaired person

Select the correct answer using the code given below.

a.1 only

b.2 and 3 only

c.3 only

d.1, 2 and 3

In The context of digital technologies for entertainment, consider the following statements :

1. In Augmented Reality (AR), a simulated environment is created and the physical world is completely shut out.

2. In Virtual Reality (VR), images generated from the computer are projected onto real life objects or surroundings.

3. AR allows individual to be present in the world and improves the experience using the camera of smartphone or PC.

4. VR closes the world, and transposes an individual, providing complete immersion experience.

Which of the statements given above is/are correct?[2019]

a.1 and 2 only

b.3 and 4

c.1, 2 and 3

d.4 only

"3D printing" has applications in which of the following?

1. Preparation of confectionery items
2. Manufacture of bionic ears
3. Automotive industry
4. Reconstructive surgeries
5. Data processing technologies

Select the correct answer using the code given below:[2018]

a.1, 3 and 4 only

b.2, 3 and 5 only

c.1 and 4 only

d.1, 2, 3, 4 and 5

If an object of mass 10 kg is moving with a uniform speed of 10 m/s, then the linear momentum and the kinetic energy of the object, respectively, are

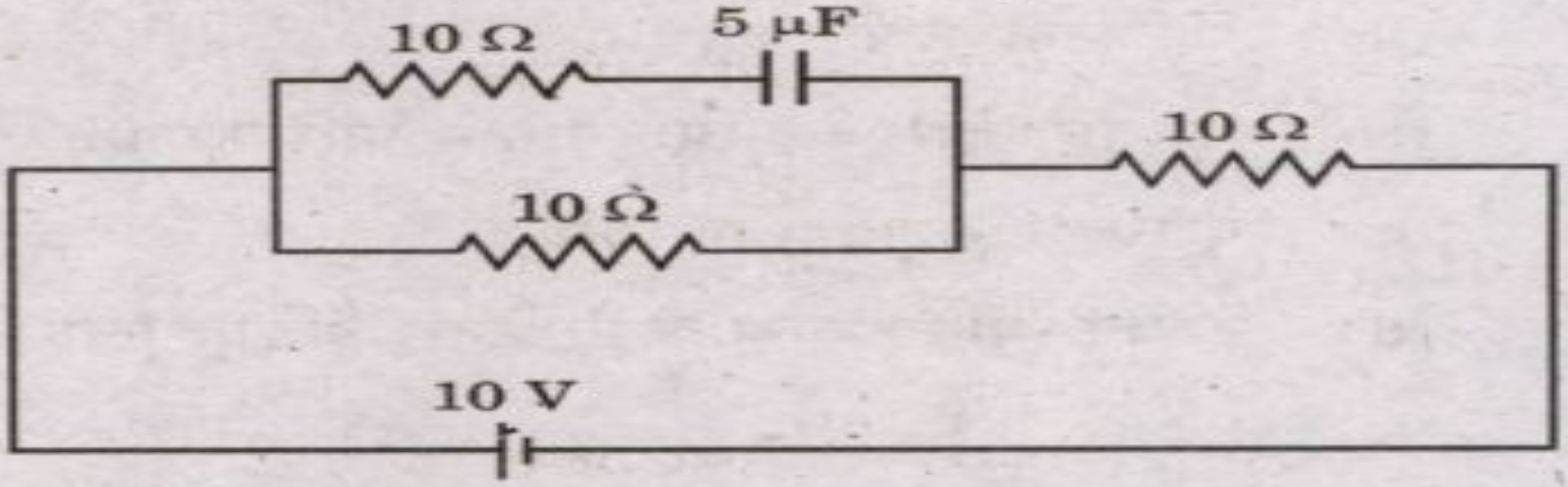
(a) 100 N.s and 500 J

(b) 100 N.s and 1000 J

(c) 200 N.s and 500 J

(d) 200 N.s and 1000 J

An electrical circuit having combinations of resistances and capacitance is given below. The current, flowing through the circuit will be



(a) 1 A

(b) 2 A

(c) 1·5 A

(d) 0·5 A

The pitch of a sound wave depends upon which one of its following characteristics ?

(a) Speed

(b) Loudness

(c) Amplitude

(d) Frequency

The device used for measuring electric current in a circuit is called

(a) Ammeter

(b) Motor

(c) Voltmeter

(d) Generator

A metal wire of length l and diameter d has a resistance R. What would be the resistance of another wire of the same metal and of same length but having double the diameter ?

(a) R

(b) $R/4$

(c) $R/2$

(d) $2R$

An object is dropped from a height onto the floor. Which one of the following remains uniform as it falls ?

(a) Its acceleration

(b) Its momentum

(c) Its kinetic energy

(d) Its potential energy

If an object is placed at the focus of a convex lens, its image is

(a) at the focus on the same side.

(b) at the focus on the opposite side.

(c) coincident with the lens.

(d) at infinity.

Which one of the following statements about the aperture of a convex lens is correct ?

(a) It is equal to its radius of curvature.

(b) It is equal to its focal length.

(c) It is independent of its radius of curvature.

(d) It is equal to half of its focal length.

When water is heated from 0°C to 4°C, its density

(a) remains constant.

(b) increases.

(c) decreases.

(d) first increases then decreases to its original value.

The acceleration due to gravity at the Earth's surface depends on

(a) its mass only.

(b) its radius only.

(c) both its mass and radius.

(d) either its mass or its radius.

Which one of the following elements is used as a timekeeper in atomic clocks?

(a) Potassium

(b) Caesium

(c) Calcium

(d) Magnesium

Which one of the following elements is involved in the control of water content of the blood?

(a) Potassium

(b) Lithium

(c) Rubidium

(d) Caesium

Which one of the following gases dissolves in water to give acidic solution?

(a) Carbon dioxide

(b) Oxygen

(c) Nitrogen

(d) Hydrogen

Why is argon gas used along with tungsten wire in an electric bulb?

(a) To increase the life of the bulb

(b) To reduce the consumption of electricity

(c) To make the emitted light colored

(d) To reduce the cost of the bulb

Which one of the following is the correct relation between the Kelvin temperature (T) and the Celsius temperature (t_c)?

(a) These are two independent temperature scales

(b) $T = t_c$

(c) $T = t_c - 273 \cdot 15$

(d) $T = t_c + 273 \cdot 15$

Sound waves ***cannot*** travel through a

(a) copper wire placed in air

(b) silver slab placed in air

(c) glass prism placed in water

(d) wooden hollow pipe placed in vacuum

Which one of the following is the value of one nanometer?

(a) 10^{-7} cm

(b) 10^{-6} cm

(c) 10^{-4} cm

(d) 10^{-3} cm

Consider the following statements :

1. There is no net moment on a body which is in equilibrium.
2. The momentum of a body is always conserved.
3. The kinetic energy of an object is always conserved.

Which of the statements given above is/are correct?

(a) 1, 2 and 3

(b) 2 and 3 only

(c) 1 and 2 only

(d) 1 only

Working of safety fuses depends upon

1. magnetic effect of the current
2. chemical effect of the current
3. magnitude of the current
4. heating effect of the current

Select the correct answer using the code given below.

(a) 1, 2, 3 and 4

(b) 1, 2 and 3 only

(c) 3 and 4 only

(d) 4 only

Bright light is found to emit from photographer's flashgun. This brightness is due to the presence of which one of the following noble gases?

(a) Argon

(b) Xenon

(c) Neon

(d) Helium

Two metallic wires made from copper have same length but the radius of wire 1 is half of that of wire 2. The resistance of wire 1 is R. If both the wires are joined together in series, the total resistance becomes

(a) $2R$

(b) $\frac{R}{2}$

(c) $\frac{5}{4}R$

(d) $\frac{3}{4}R$

When the Sun is near the horizon during the morning or evening, it appears reddish. The phenomenon that is responsible for this observation is

(a) reflection of light

(b) refraction of light

(c) dispersion of light

(d) scattering of light

A wire of copper having length l and area of cross-section A is taken and a current I is flown through it. The power dissipated in the wire is P. If we take an aluminium wire having same dimensions and pass the same current through it, the power dissipated will be

(a) P

(b) $< P$

(c) $> P$

(d) $2P$

The pressure of a fluid varies with depth h as $P = P_0 + \rho gh$, where ρ is the fluid density. This expression is associated with

(a) Pascal's law

(b) Newton's law

(c) Bernoulli's principle

(d) Archimedes' principle

Two identical solid pieces, one of gold and other of silver, when immersed completely in water exhibit equal weights. When weighed in air (given that density of gold is greater than that of silver)

(a) the gold piece will weigh more

(b) the silver piece will weigh more

(c) both silver and gold pieces weigh equal

(d) weighing will depend on their masses

If the wavelengths corresponding to ultraviolet, visible and infrared radiations are given as λ_{UV}, λ_{VIS} and λ_{IR} respectively, then which one of the following gives the correct relationship among these wavelengths?

(a) $\lambda_{UV} < \lambda_{IR} < \lambda_{VIS}$

(b) $\lambda_{UV} > \lambda_{VIS} > \lambda_{IR}$

(c) $\lambda_{UV} > \lambda_{IR} > \lambda_{VIS}$

(d) $\lambda_{UV} < \lambda_{VIS} < \lambda_{IR}$

An electron and a proton starting from rest get accelerated through potential difference of 100 kV. The final speeds of the electron and the proton are V_e and V_p respectively. Which one of the following relations is correct?

(a) $V_e > V_p$

(b) $V_e < V_p$

(c) $V_e = V_p$

(d) Cannot be determined

If two vectors $\vec{A}$ and $\vec{B}$ are at an angle $\theta \neq 0^{\circ}$, then

(a) $|\vec{A}|+|\vec{B}|=|\vec{A}+\vec{B}|$

(b) $|\vec{A}|+|\vec{B}|>|\vec{A}+\vec{B}|$

(c) $|\vec{A}|+|\vec{B}|<|\vec{A}+\vec{B}|$

(d) $|\vec{A}|+|\vec{B}|=|\vec{A}-\vec{B}|$

Which of the following is/are state function/functions?

1. $q+w$
2. q
3. w
4. $H-TS$

Select the correct answer using the code given below.

(a) 1 and 4 only

(b) 1, 2 and 4

(c) 2, 3 and 4

(d) 1 only

For a certain reaction, $\Delta G^{\theta} = -45\ kJ/mol$ and $\Delta H^{\theta} = -90\ kJ/mol$ at 0 °C. What is the minimum temperature at which the reaction will become spontaneous, assuming that ΔH^{θ} and ΔS^{θ} are independent of temperature?

(a) 273 K

(b) 298 K

(c) 546 K

(d) 596 K

The PCl_5 molecule has trigonal bipyramidal structure. Therefore, the hybridization of *p* orbitals should be

(a) sp^2

(b) sp^3

(c) dsp^2

(d) dsp^3

In spherical polar coordinates (γ, θ, α), θ denotes the polar angle around z-axis and α denotes the azimuthal angle raised from x-axis. Then the y-component of $\vec{P}$ is given by

(a) $P\sin\theta\sin\alpha$

(b) $P\sin\theta\cos\alpha$

(c) $P\cos\theta\sin\alpha$

(d) $P\cos\theta\cos\alpha$

For an ideal gas, which one of the following statements does ***not*** hold true?

(a) The speed of all gas molecules is same.

(b) The kinetic energies of all gas molecules are not same.

(c) The potential energy of the gas molecules is zero.

(d) There is no interactive force between the molecules.

Soap solution used for cleaning purpose appears cloudy. This is due to the fact that soap micelles can

(a) refract light

(b) scatter light

(c) diffract light

(d) polarize light

The frequency (in Hz) of a note that is one octave higher than 500 Hz is

(a) 375

(b) 750

(c) 1000

(d) 2000

If the speed of a moving magnet inside a coil increases, the electric current in the coil

(a) increases

(b) decreases

(c) reverses

(d) remains the same

Magnification is

(a) actual size of specimen / observed size

(b) observed size of specimen / actual size

(c) actual size of specimen – observed size

(d) actual size of specimen × observed size

A boy throws four stones of same shape, size and weight with equal speed at different initial angles with the horizontal line. If the angles are 15°, 30°, 45° and 60°, at which angle the stone will cover the maximum distance horizontally?

(a) 15°

(b) 30°

(c) 45°

(d) 60°

Consider the following statements :

1. A person with myopia can see distant objects distinctly but cannot see nearby objects clearly.
2. A person with hypermetropia cannot see distant objects clearly.
3. A person with presbyopia can see nearby objects without corrective glasses.

Which of the statements given above is/are ***not*** correct?

(a) 1, 2 and 3

(b) 1 and 2 only

(c) 2 and 3 only

(d) 3 only

93. X-rays comprise of

(a) Electrons only

(b) Protons only

(c) Neutrons only

(d) Electromagnetic radiations

70. Consider the following eye disorders

1. Cataract
2. Colour blindness
3. Night blindness

Which of the above disorders is/are essentially genetic in nature ?

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

An echo is heard after 5 seconds of the production of sound which moves with a speed of 340 m/s. What is the distance of the mountain from the source of sound which produced the echo ?

(a) 0·085 km

(b) 0·85 km

(c) 0·17 km

(d) 1·7 km

A 100 W electric bulb is used for 10 hours a day. How many units of energy are consumed in 30 days ?

(a) 1

(b) 10

(c) 30

(d) 300

The coil in a heater is made of

(a) nichrome

(b) tungsten

(c) copper

(d) iron