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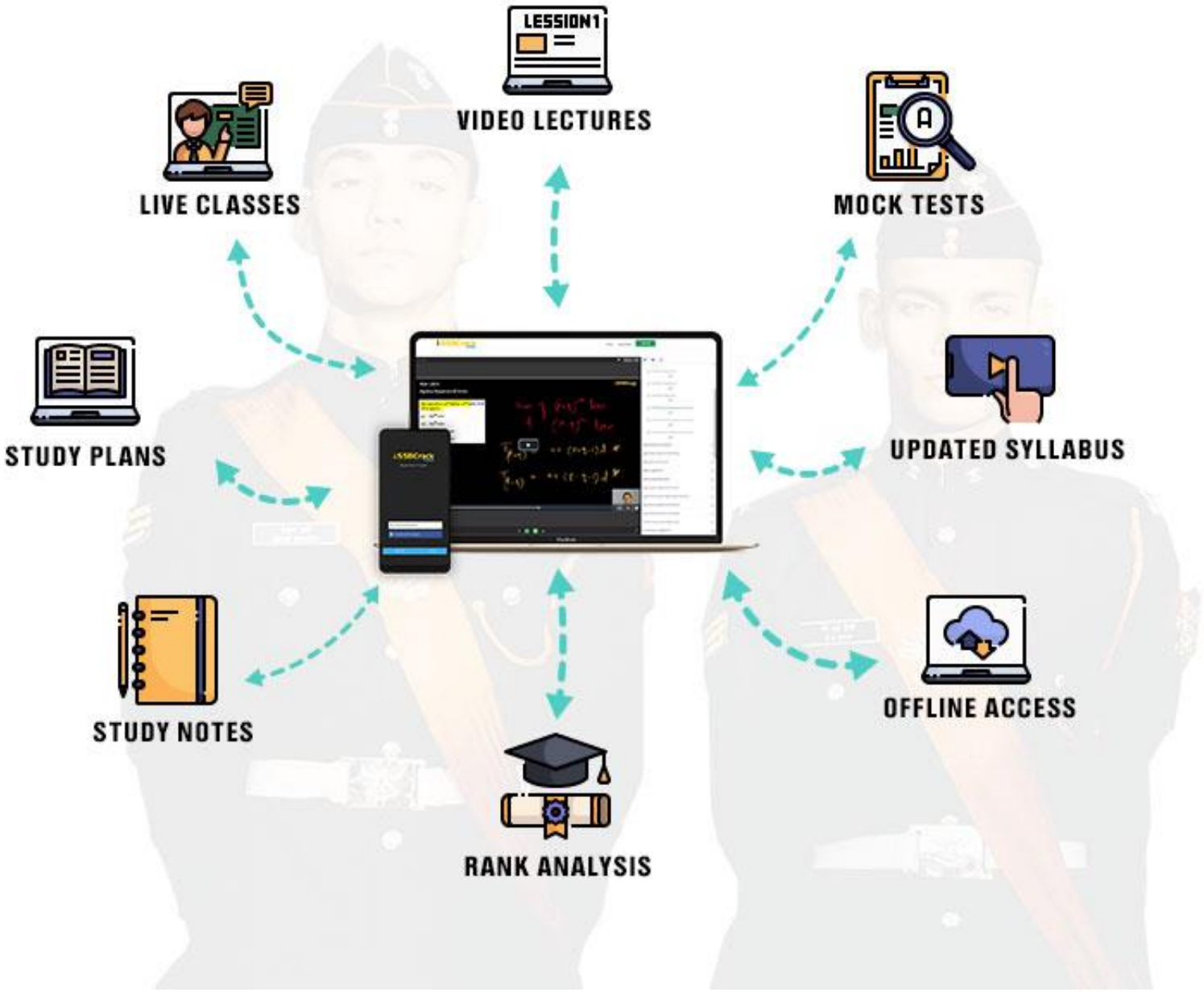

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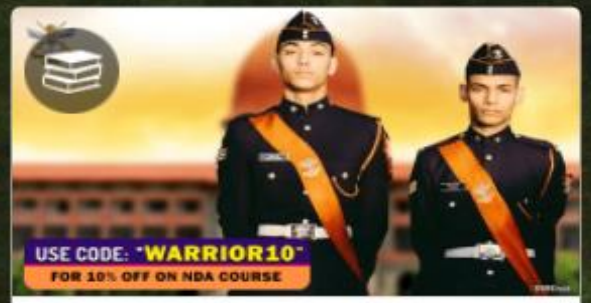

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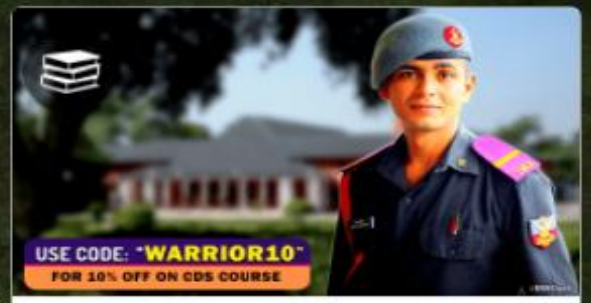

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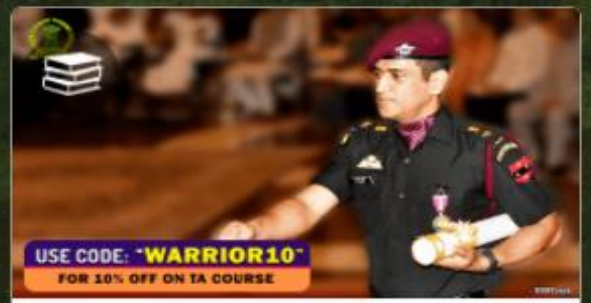

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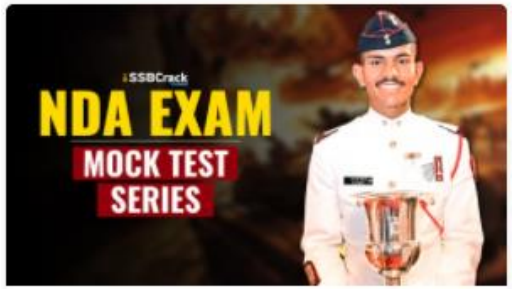

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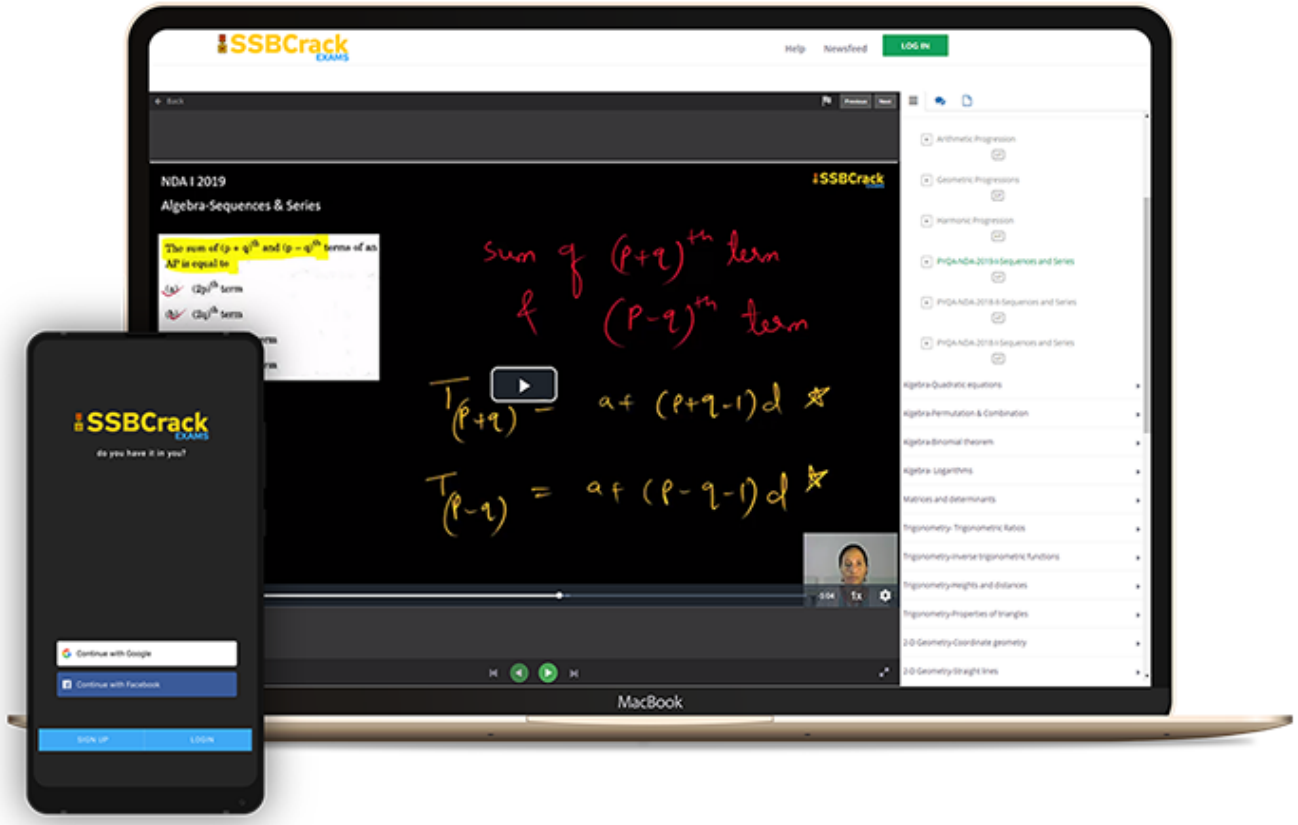

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Q) Consider the following statements about Light year:

1. Light year is a unit for measurement of very large distances.
2. Light year is a unit for measurement of very large time intervals.
3. Light year is a unit for measurement of intensity of light

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

SSBCrack EXAMS

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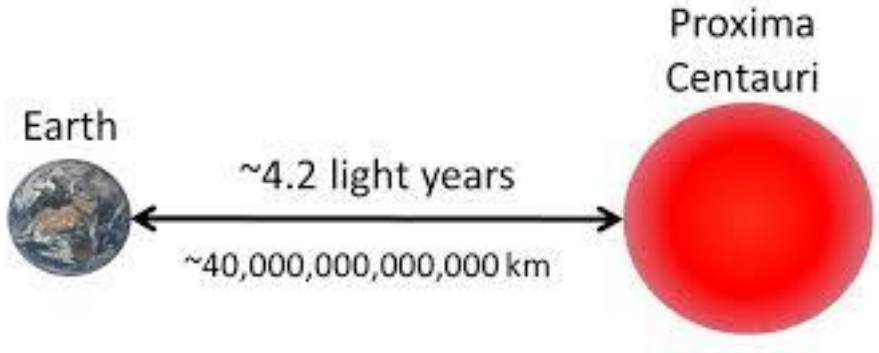

NDA 2 2022 - Physics Marathon

Q) Which one of the following regarding density of water at atmospheric pressure is correct?

(a) Density of water at 4^0 C is $1000 kg/m^3$

(b) Density of water at 0^0 C is $1000 kg/m^3$

(c) Density of water at 0^0 C is $100 kg/m^3$

(d) Density of water at 4^0 C is $10 kg/m^3$

SSBCrack EXAMS

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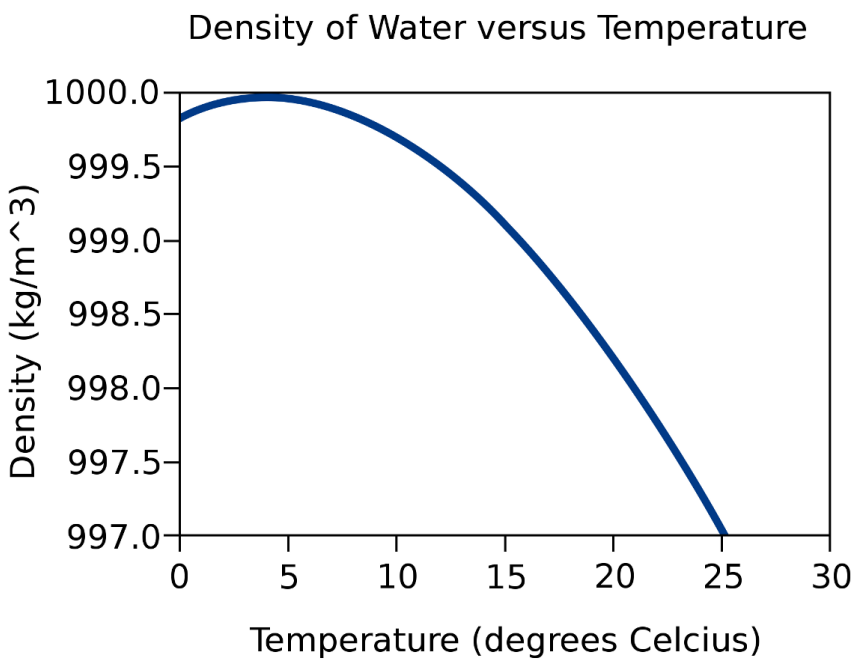

NDA 2 2022 - Physics Marathon

Q) Which of the following pairs of physical phenomenon and the discoverer is/are correctly matched?

1. James Chadwick : Photoelectric effect
2. Albert Einstein : Neutron
3. Marie Curie : Radium

Select the correct answer using the code given below:

(a) 1,2 and 3

(b) 1 and 2 only

(c) 2 and 3 only

(d) 3 only

SSBCrack EXAMS

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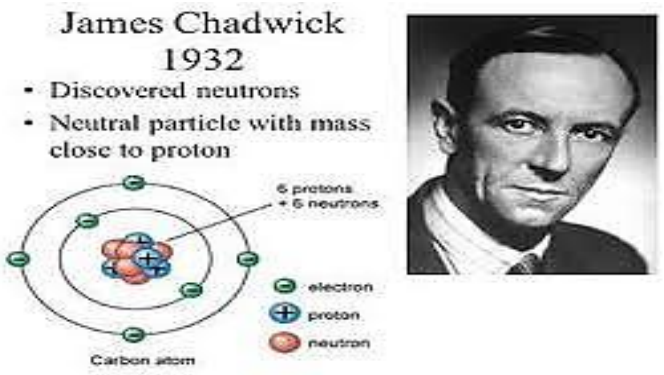

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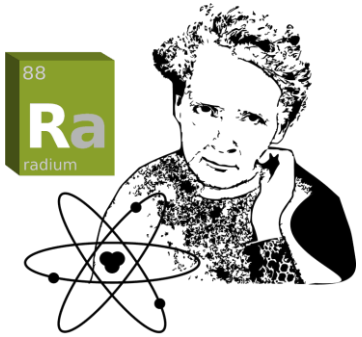

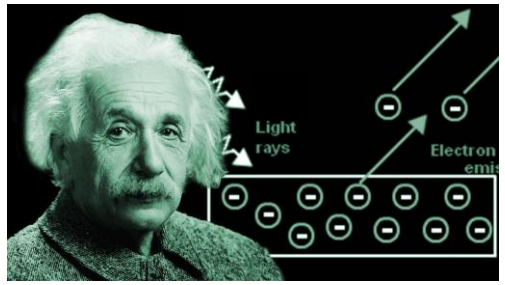

SSBCrack EXAMS

Q) LED (a semiconductor device) is an abbreviation that stands for

(a) License for Energy Detector

(b) Light Energy Device

(c) Light Emitting Diode

(d) Lost Energy Detector

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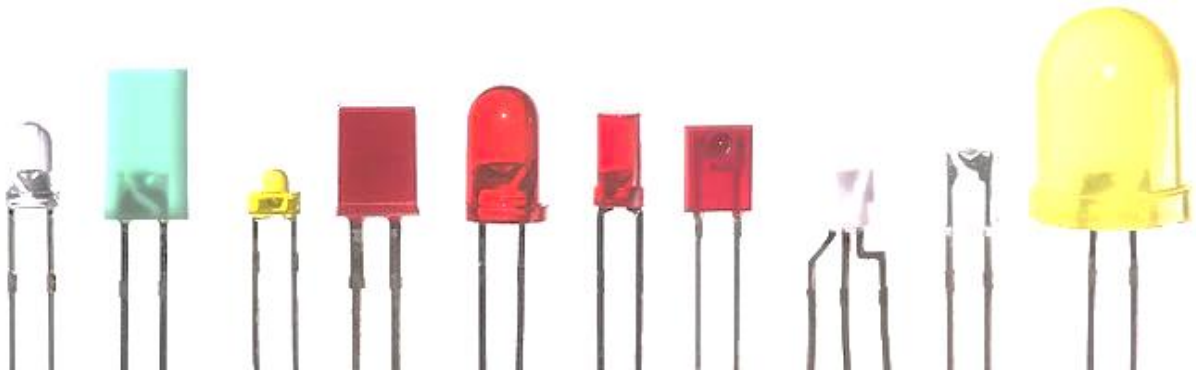

NDA 2 2022 - Physics Marathon

Q) The statement “friction force is a contact force while magnetic force is a non contact force” is

(a) always true

(b) true only at 0^0 C

(c) a false statement

(d) either true or false depending upon the temperature of the surroundings

NDA 2 2022 - Physics Marathon

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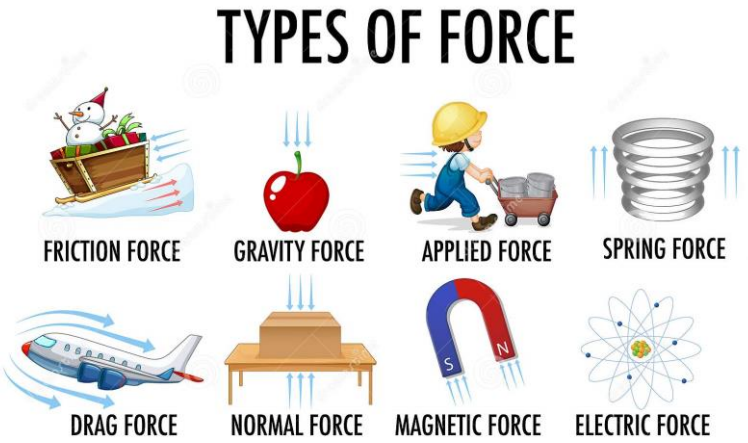

(a) **always true**

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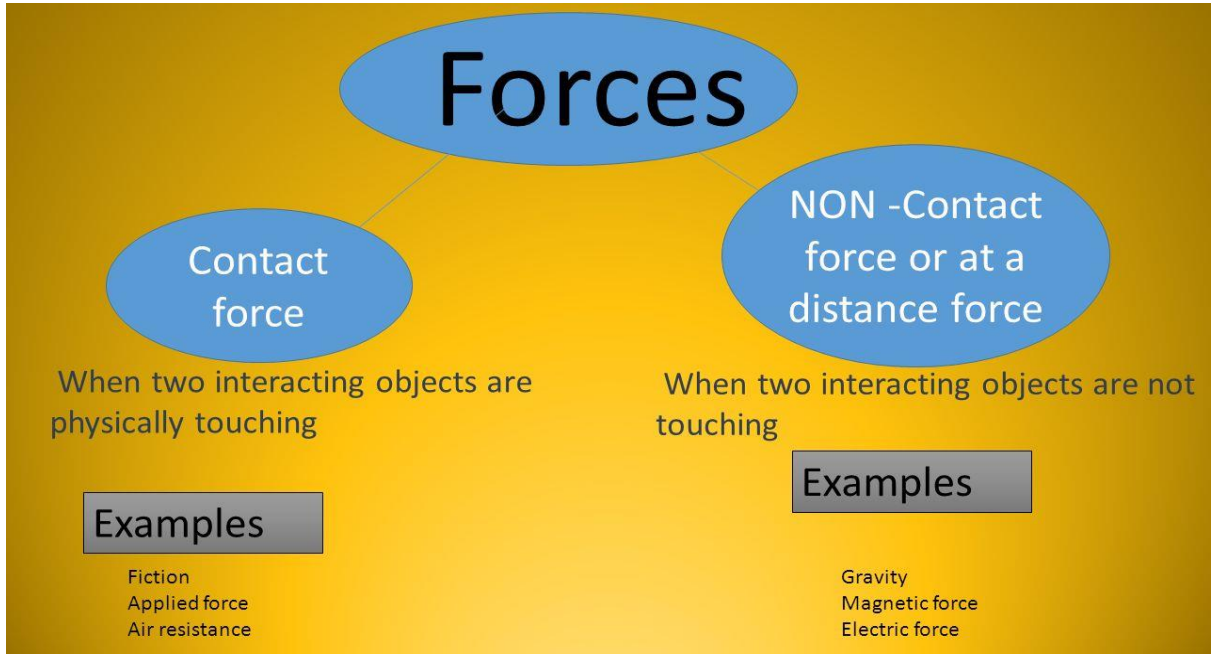

NDA 2 2022 - Physics Marathon

Q) Which one of the following is the lowest possible temperature?

(a) 0^0 Celsius

(b) -073^0 Celsius

(c) -173^0 Celsius

(d) -273^0 Celsius

SSBCrack EXAMS

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(c) -173^0 Celsius

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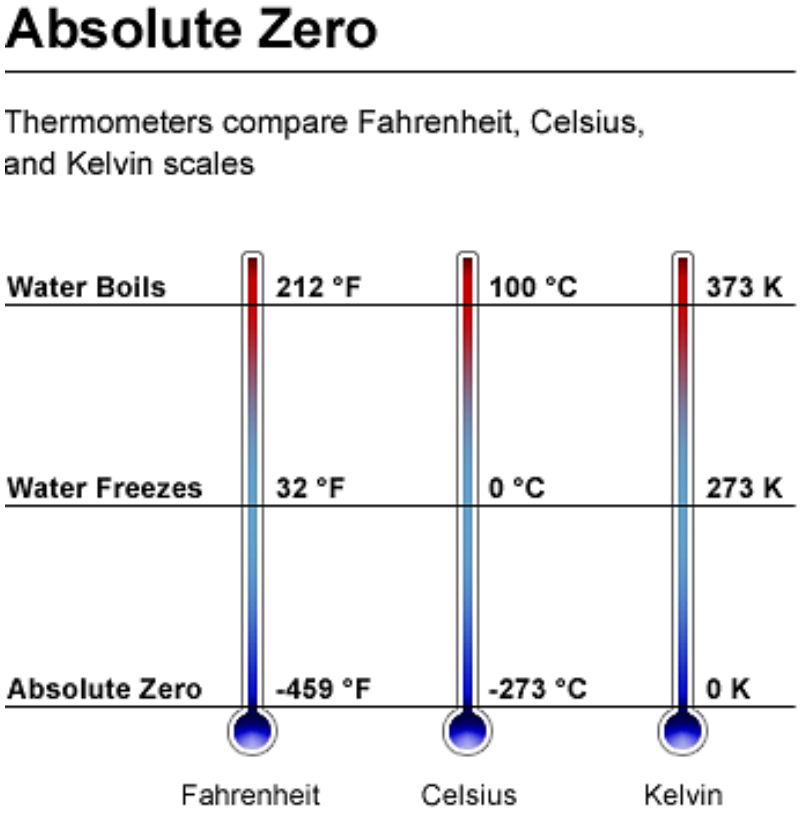

- **Temperature:** A physical quantity that measures the degree of hotness or coolness of the body is known as Temperature.
  - Temperature is measured in Celsius (°C), Fahrenheit (°F), and Kelvin.
- **Absolute temperature Scale:** The **Kelvin scale** is an absolute temperature scale. When the temperature is measured in Kelvin.
  - This means that the theoretically lowest possible temperature is assigned the value of zero.
- **Absolute Zero:** Zero degrees on the Kelvin scale is known as **absolute zero i.e. 0 K.**
- It is theoretically the point at which there is no molecular motion to produce thermal energy.
- **Degree Celsius** and **Kelvin** are the standard units of the temperature.

NDA 2 2022 - Physics Marathon

Q) Numerically two thermometers, one in Fahrenheit scale and another in Celsius scale shall read same at

(a) -40^0

(b) 0^0

(c) -273^0

(d) 100^0

SSBCrack EXAMS

Q) Numerically two thermometers, one in Fahrenheit scale and another in Celsius scale shall read same at

(a) -40^0

(b) 0^0

(c) -273^0

(d) 100^0

- The relation between the Celsius scale and Fahrenheit scale is given by

$$\Rightarrow \frac{F-32}{9} = \frac{C}{5}$$

By using the hit and trial method, suppose the -40° the **centigrade and Fahrenheit scales of temperature** are the **same** i.e., F = C

- The above equation can be written for C, then

$$\Rightarrow \frac{C-32}{9} = \frac{C}{5}$$

$\Rightarrow$ 5C - 160 = 9C

$\Rightarrow$ **C = -40°**

SSBCrack EXAMS

Q) The image we see in plane mirror is

(a) real and thus can be photographed

(b) virtual and nearer than the object

(c) virtual and is laterally inverted

(d) real but cannot be photographed

SSBCrack EXAMS

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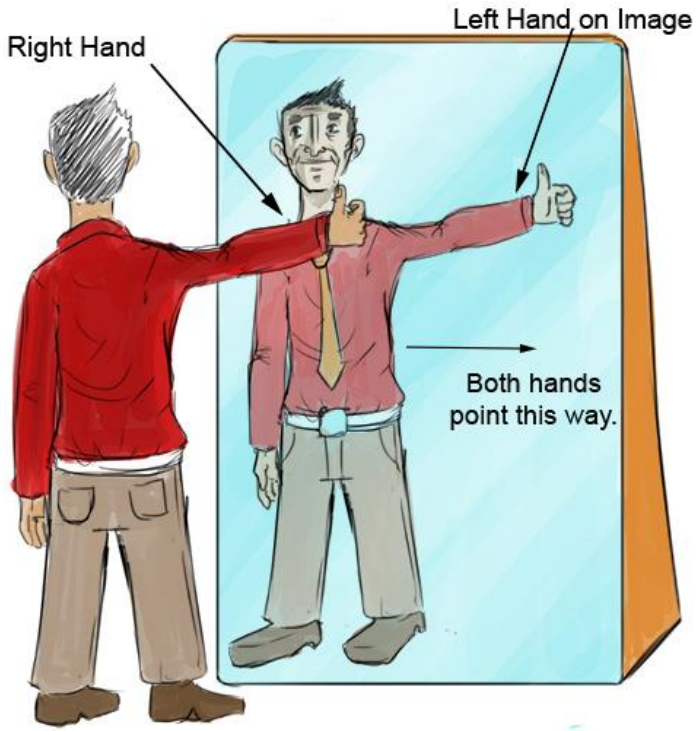

NDA 2 2022 - Physics Marathon

Q) Which of the following are the primary colours of light?

(a) yellow, red and green

(b) Blue, red and green

(c) Violet, red and yellow

(d) Indigo, Violet and green

SSBCrack EXAMS

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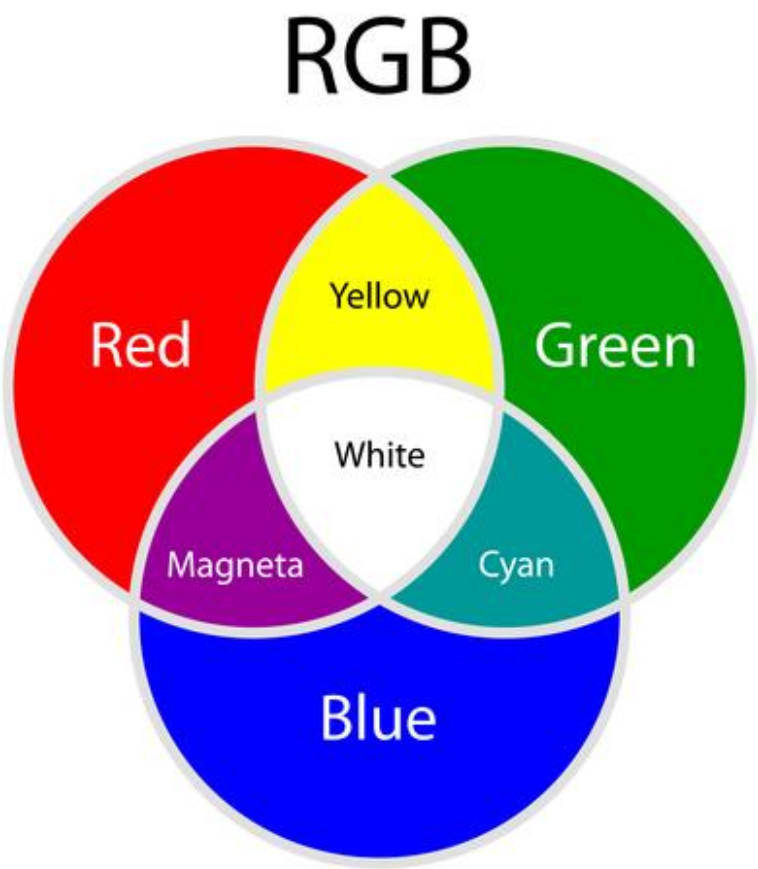

NDA 2 2022 - Physics Marathon

Q) A glass prism splits white light into different colours. This phenomenon is called dispersion of light by prism. Which one of the following statements is correct?

(a) Red light will deviate the most and it is because of the reflection of light

(b) Violet light will deviate the most and it is because of the refraction of light

(c) Red light will deviate the most and it is because of the refraction of light

(d) Violet light will deviate the most and it is because of the reflection of light

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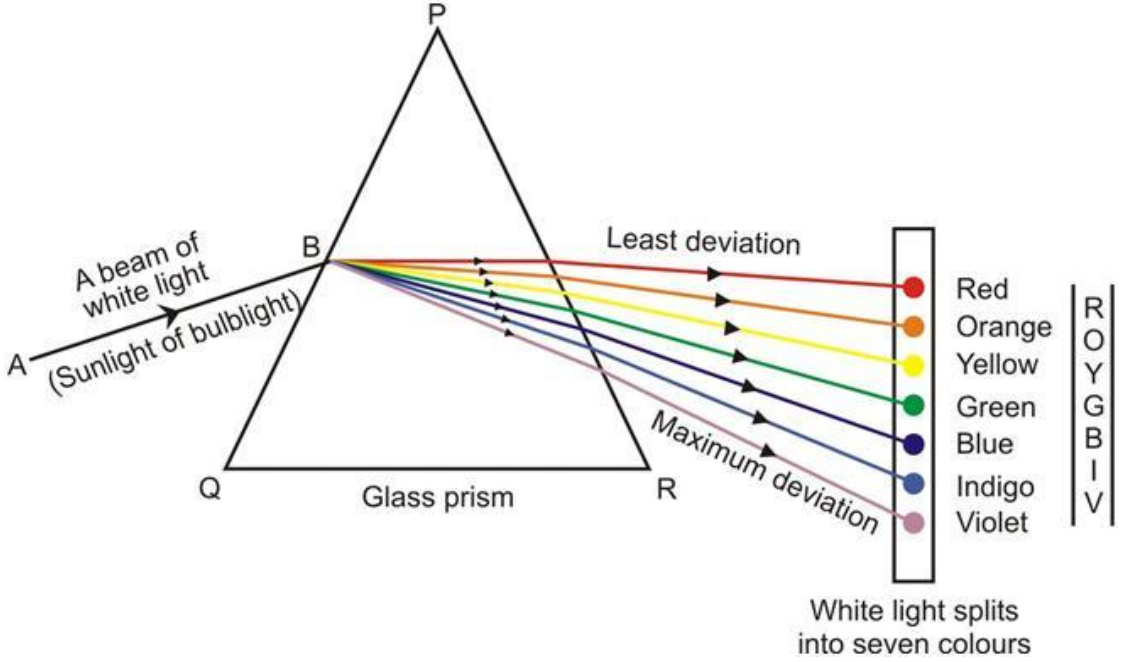

NDA 2 2022 - Physics Marathon

Q) A current of 1.0 A is drawn by a filament of an electric bulb for 10 minutes. The amount of electric charge that flows through the circuit is

(a) 0.1 C

(b) 10 C

(c) 600 C

(d) 800 C

SSBCrack EXAMS

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(a) 0.1 C

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$$\text{Electric curernt (I)} = \frac{\text{Electric charge (Q)}}{\text{Time (t)}}$$

- SI unit of current is **ampere** and it is denoted by the letter **A**.

CALCULATION:

Given - Electric current (I) = 1 A and time (t) = 10 minutes = 600 sec

- The **amount of electric charge that flows through the circuit** is

$\Rightarrow Q = I \times t$

$\Rightarrow Q = 1 \times 600 = 600$ C

NDA 2 2022 - Physics Marathon

Q) Which one of the following formulas does ***not*** represent electrical power?

(a) I^2R

(b) IR^2

(c) VI

(d) V^2/R

SSBCrack EXAMS

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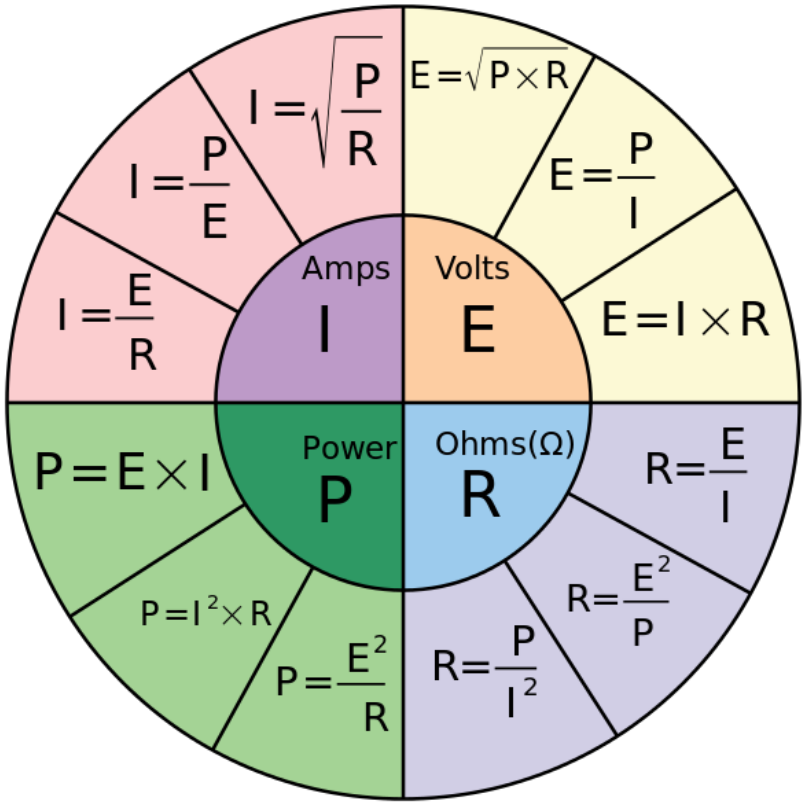

NDA 2 2022 - Physics Marathon

Q) The sound created in a big hall persists because of the repeated reflections. The phenomenon is called

(a) Reverberation

(b) Dispersion

(c) Refraction

(d) Diffraction

SSBCrack EXAMS

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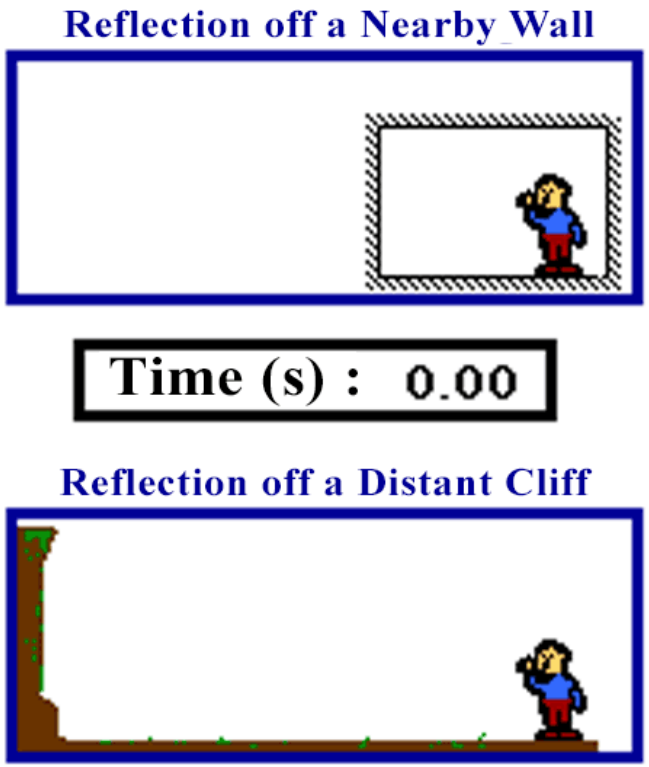

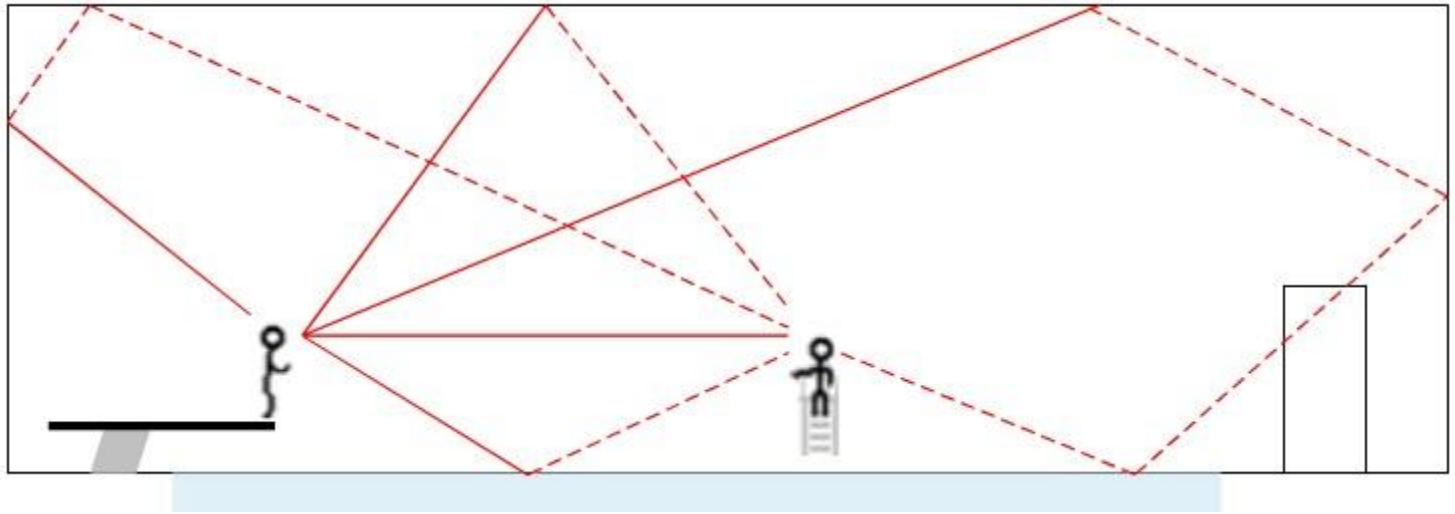

NDA 2 2022 - Physics Marathon

Q) When light is scattered by a molecule and the frequency of the scattered light is changed, this phenomenon is called

(a) Rayleigh scattering

(b) Raman effect

(c) Photo electric effect

(d) Rutherford scattering

SSBCrack EXAMS

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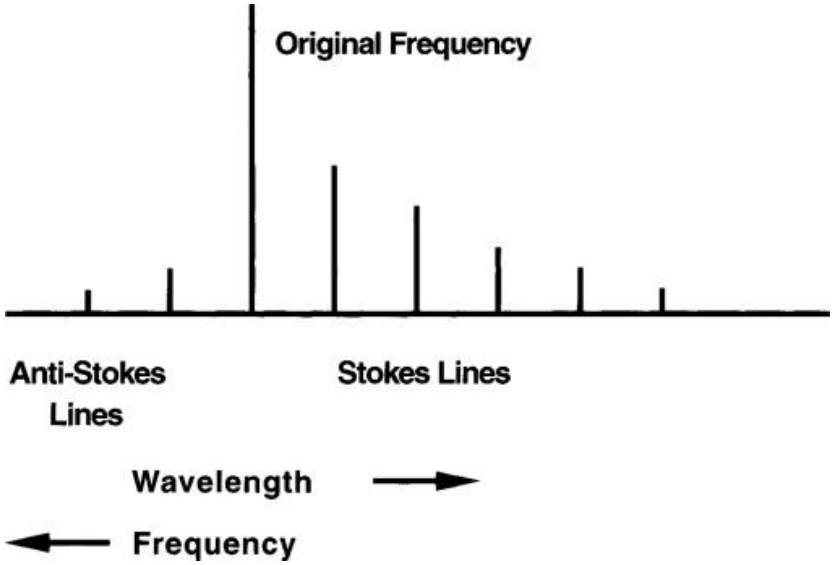

With the Raman effect, monochromatic light is scattered by a molecule. A frequency shift then occurs above and below the incident light in a small fraction of the light scattered, which is known as the anti-Stokes and Stokes Shift.

NDA 2 2022 - Physics Marathon

Q) Which one of the following conclusions could ***not*** be derived from Rutherford's α-particle scattering experiment?

(a) Most of the space in the atom is empty

(b) The radius of the item is about 10^5 times the radius of the nucleus

(c) Electrons move in a circular path of fixed energy called orbits

(d) Nearly all the mass of the atom resides in the nucleus

SSBCrack EXAMS

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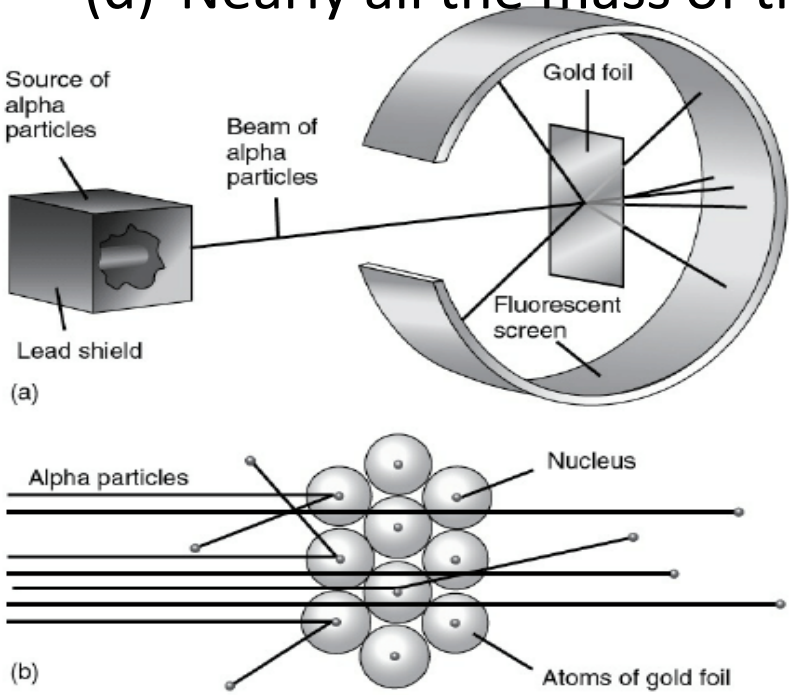

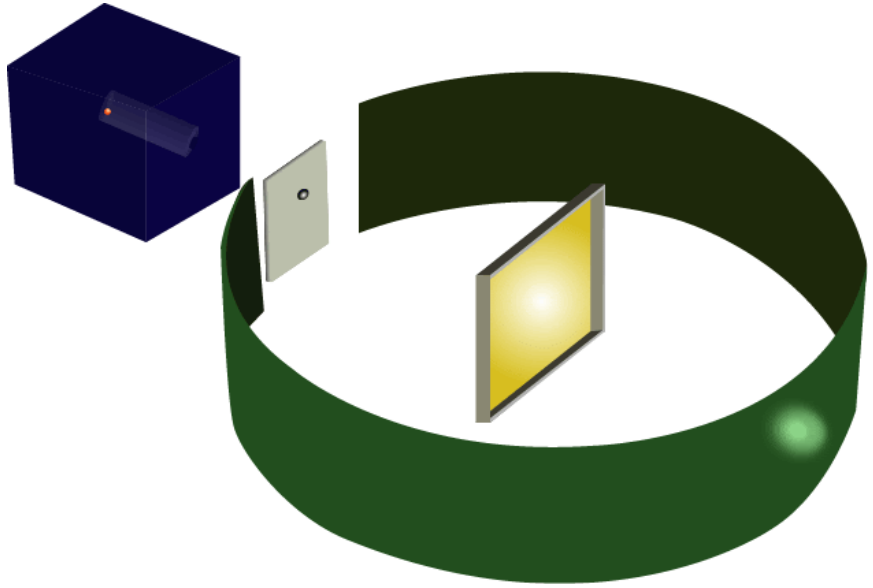

SSBCrack EXAMS

Q) Twinkling of stars is due to

(a) particular frequencies of the Starlight

(b) reflection of Starlight from the oceanic surface

(c) atmospheric refraction of Starlight

(d) magnetic field of earth

SSBCrack EXAMS

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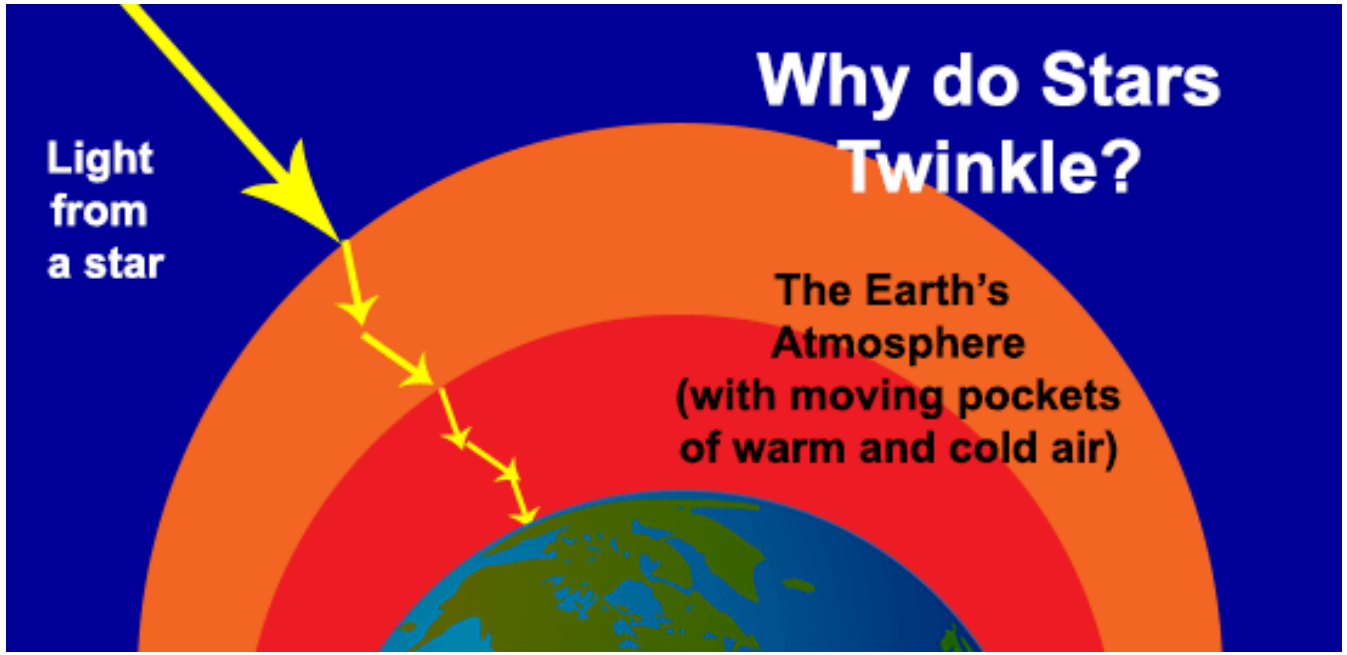

NDA 2 2022 - Physics Marathon

Q) Which one of the following ***cannot*** be the unit of frequency of a sound wave?

(a) dB

(b) S^{-1}

(c) Hz

(d) min^{-1}

NDA 2 2022 - Physics Marathon

Q) Which one of the following ***cannot*** be the unit of frequency of a sound wave?

(a) dB

(b) S^{-1}

(c) Hz

(d) min^{-1}

- Loudness – sound level, describes what you actually hear. A sound wave of greater intensity sounds louder
- Decibels (dB) – measures loudness. A sound you can barely hear is 0 dB. 100dB can damage your ears.

NDA 2 2022 - Physics Marathon

Q) ‘Beats’ is a phenomenon that occurs when frequencies of two harmonic waves are

(a) Equal

(b) far apart

(c) multiples of each other

(d) nearly same

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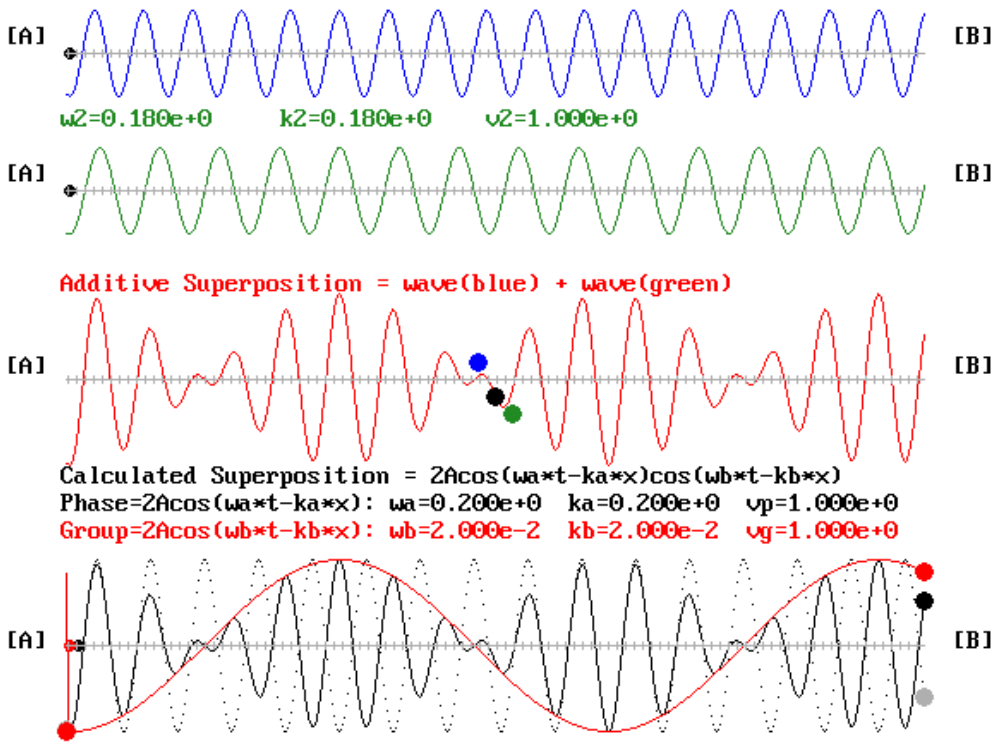

SSBCrack EXAMS

Q) Hooke's law essentially defines

(a) Stress

(b) Strain

(c) Yield point

(d) Elastic limit

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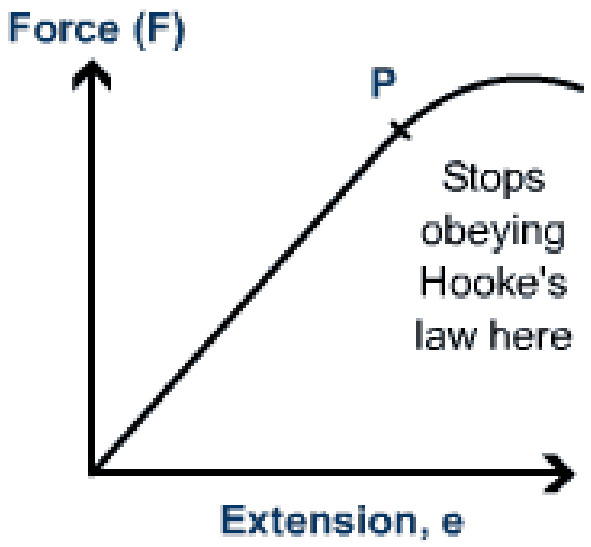

Hooke's law is a principle which states that the force needed to extend or compress a spring by some distance is proportional to that distance. This proportionality constant defines the Elastic limit

SSBCrack EXAMS

Q) Heat always flows

(a) from a colder object to a hotter object

(b) from a hotter object to a colder object

(c) in both the directions

(d) heat never flows from one object to other

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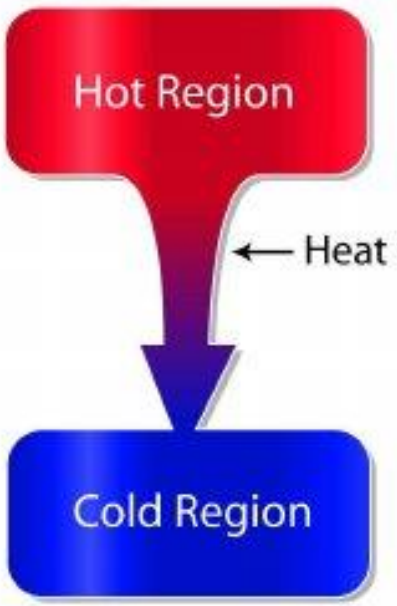

Heat will always be transferred from the hotter to the cooler object. The objects will exchange thermal energy, until thermal equilibrium is reached.

SSBCrack EXAMS

Q) Light waves are incident on an air-glass boundary. Some of the light waves are reflected and some are refracted in the glass. Which one of the following properties is the same for the incident wave and the refracted wave?

(a) Speed

(b) Direction

(c) Brightness

(d) Frequency

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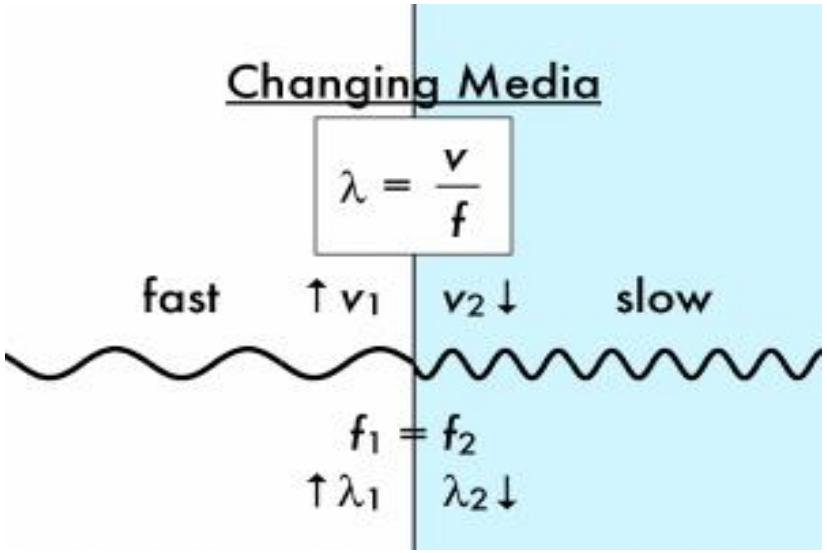

NDA 2 2022 - Physics Marathon

Q) Which one of the following statements is true for a simple harmonic oscillator?

(a) Force acting is directly proportional to the displacement from the mean position and is in same direction

(b) Force acting is directly proportional to the displacement from the mean position and is in opposite direction

(c) Acceleration of the oscillator is constant

(d) The velocity of the oscillator is not periodic

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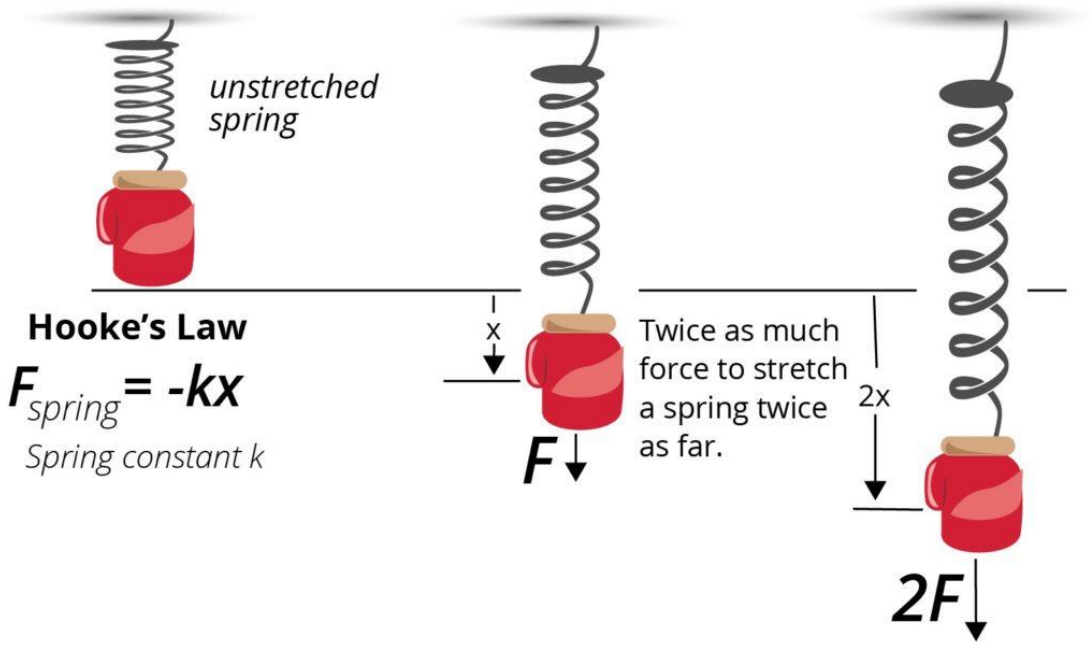

NDA 2 2022 - Physics Marathon

Q) If a ray of light enters from a rarer medium to denser medium at zero angle of incidence, it would

(a) reflect back

(b) go straight

(c) turned towards right

(d) bend at 45^0

SSBCrack EXAMS

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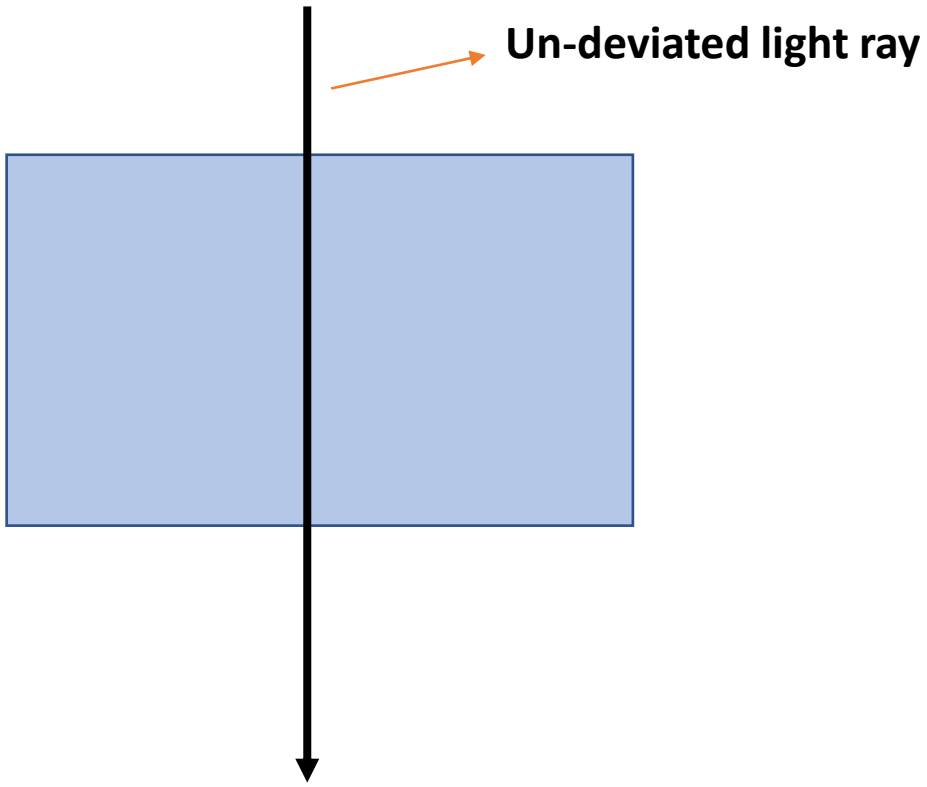

SSBCrack EXAMS

Q) Mirage is an illusion of

(a) only dispersion of light

(b) only reflection of light

(c) only scattering of light

(d) both refraction and total internal reflection of light

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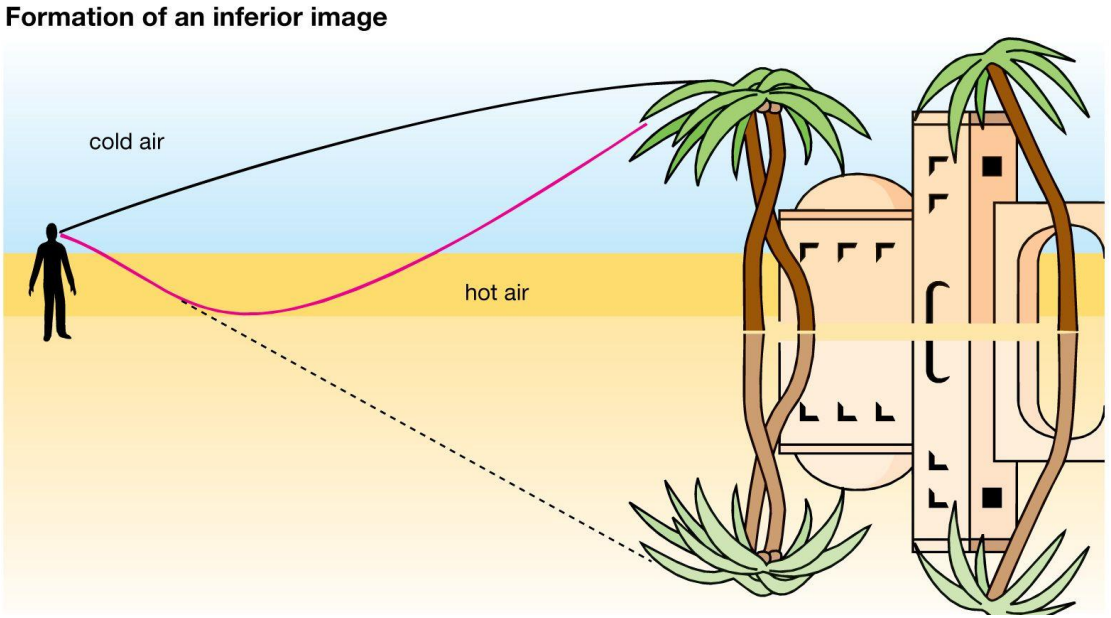

NDA 2 2022 - Physics Marathon

Q) A mass M is dragged by a pulley on a horizontal plane by a force antiparallel to its displacement. The work done in pulling the mass M is

(a) zero

(b) positive

(c) infinite

(d) negative

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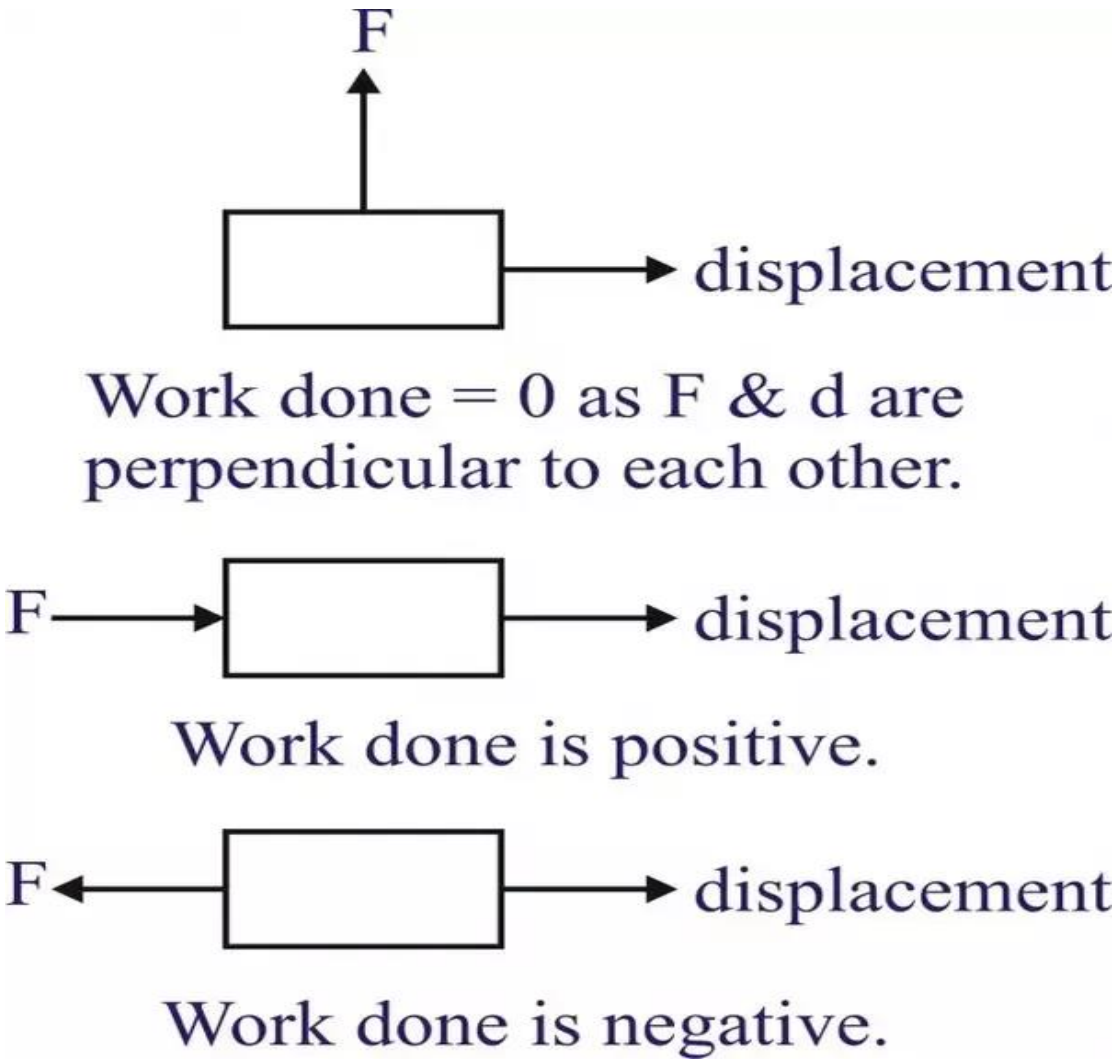

NDA 2 2022 - Physics Marathon

Q) A 5N force is defined when a mass of 10 kg is accelerated with

(a) 5.0 cm/s^2

(b) 0.5 m/s^2

(c) 0.5 cm/s^2

(d) 5.0 m/s^2

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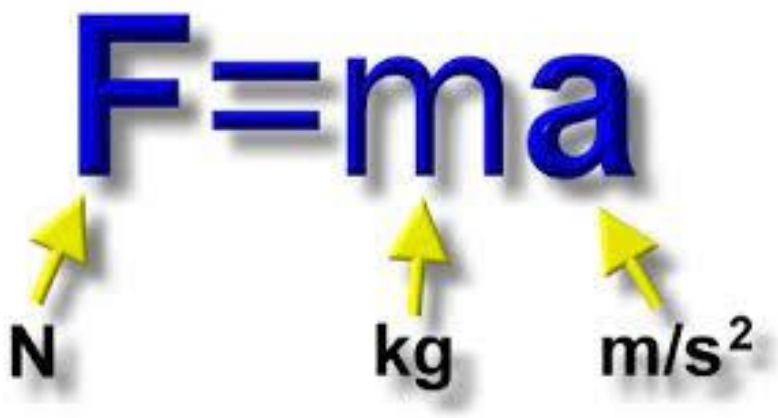

NDA 2 2022 - Physics Marathon

Q) A boy of mass 52 kilogram jumps with a horizontal velocity of 2 m/s onto a stationary cart of mass 3 kg. The cart is fixed with frictionless wheels. Which one of the following would be the speed of the cart?

(a) 2.15m/s

(b) 1.89m/s

(c) 1.51m/s

(d) 2.51m/s

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NDA 2 2022 - Physics Marathon

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(a) thermal energy

(b) potential energy

(c) kinetic energy

(d) electric energy

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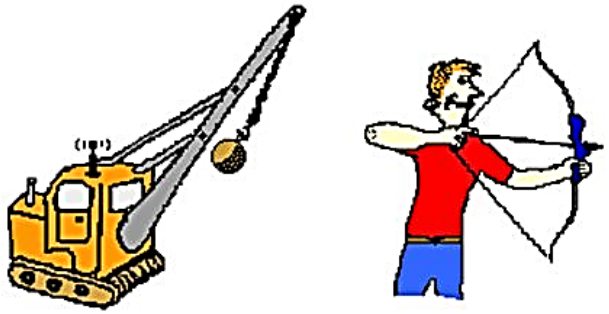
(d) electric energy

Potential Energy

- Potential energy is stored energy.
- Gravitational potential energy- where object is located
- Elastic potential energy- due to a change in shape



NDA 2 2022 - Physics Marathon

Q) A sound wave has a frequency of 1kHz and wavelength 50 cm. How long will it take to travel 1km?

(a) 5 s

(b) 4 s

(c) 3 s

(d) 2 s

SSBCrack EXAMS

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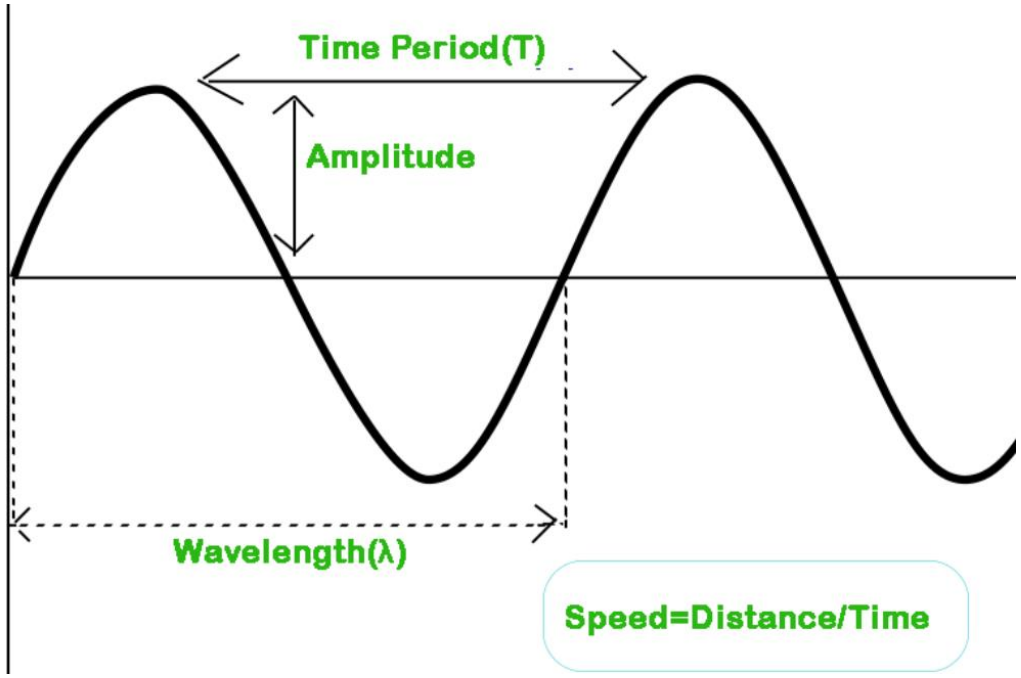

$$v = f\lambda$$

v = velocity
f = frequency
λ = wavelength

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NDA 2 2022 - Physics Marathon

Q) What is the mass of a material, whose specific heat capacity is 400 J/(kg ^{0}C) for a rise in temperature from 15 ^{0}C to 25 ^{0}C, when heat received is 20 kJ ?

(a) 0.1 kg

(b) 1 kg

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(d) 5 kg

$$Q = m\,c\,\Delta T$$

Q = energy transfered (joules)
m = mass of water (grams)
c = specific heat capacity
ΔT = temperature change (K or ^{o}C)

NDA 2 2022 - Physics Marathon

Q) The specific latent heat of vaporization of substance is the quantity of heat needed to change unit mass from

(a) liquid to vapour with a change of temperature

(b) liquid to vapour without a change of temperature

(c) vapour to liquid with a change of temperature

(d) None of the above

SSBCrack EXAMS

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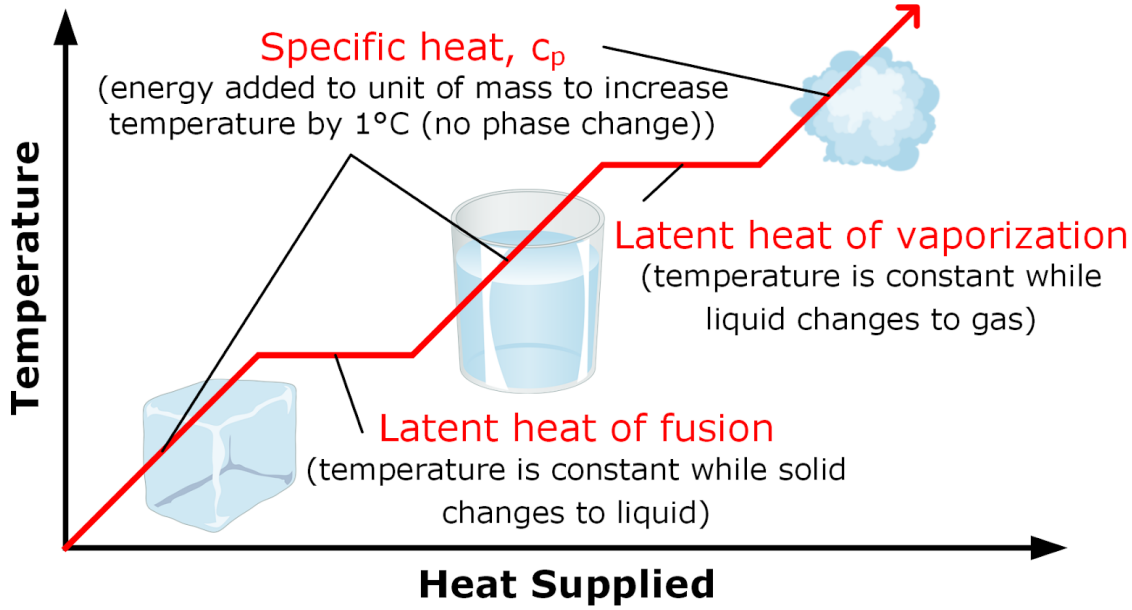

NDA 2 2022 - Physics Marathon

Q) Evaporation from the surface of a given liquid takes place more rapidly when

(a) the temperature is high and the surface area of the liquid is large

(b) The temperature is low and the surface area of the liquid is large

(c) the temperature is low and the surface area of the liquid is small

(d) the temperature is high and the surface area of the liquid is small

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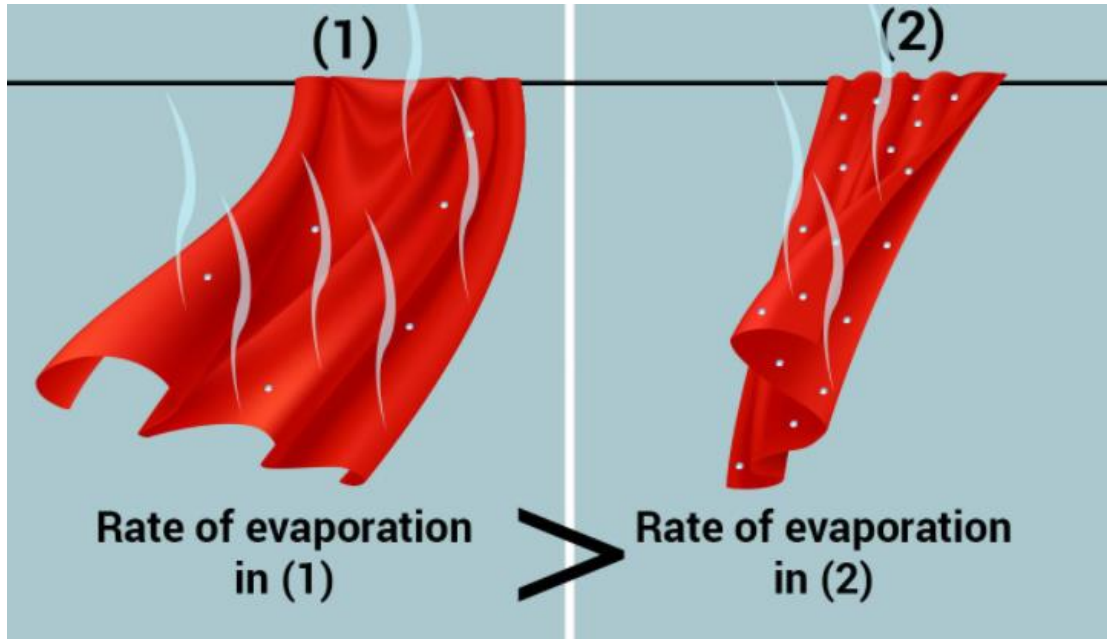

NDA 2 2022 - Physics Marathon

Q) Which of the following statements correctly explains/explain the existence of a positive force between two electric charges?

1. Both the charges are positive.
2. Both charges are negative.
3. Both the charges are oppositely charged.

Select the correct answer using the code given below.

(a) 1 only

(b) 2 only

(c) 1 and 2 only

(d) 1, 2 and 3

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Select the correct answer using the code given below.

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(b) 2 only

(c) 1 and 2 only

(d) 1, 2 and 3

$$F_e = \frac{kq_1q_2}{r^2}$$

- Coulomb's law states that the electrical force between two charged objects is **directly** proportional to the product of the **quantity of charge** on the objects and **inversely** proportional to the **square of the separation distance** between the two objects.
- The force value is **positive** (***repulsive***) when q_1 and q_2 are of **like charge** - either both "+" or both "-".
- The force value is **negative** (**attractive**) when q_1 and q_2 are of opposite charge - one is "+" and the other is "-".

NDA 2 2022 - Physics Marathon

Q) An electric wire of resistance 50 ohm is cut into five equal wires. These wires are then connected in parallel. What is the equivalent resistance of this combination?

(a) 2 ohm

(b) 10 ohm

(c) 0.5 ohm

(d) 5 ohm

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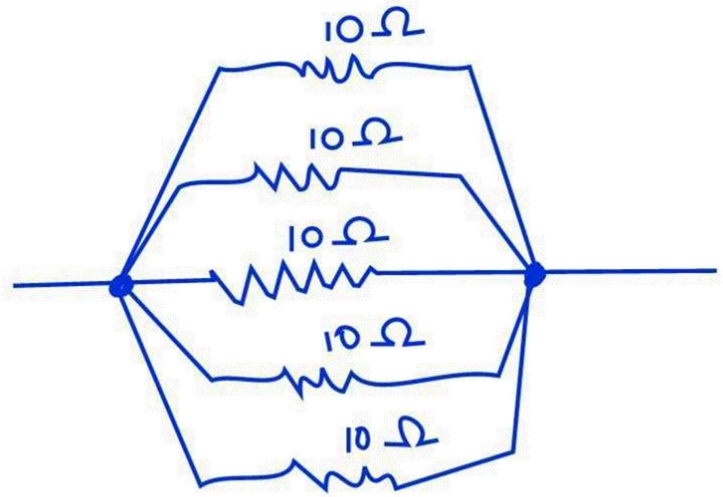

NDA 2 2022 - Physics Marathon

Q) The electric field lines from in isolated positively charged conducting sphere are

(a) tangential to the conducting surface

(b) at right angles to the conducting surface and towards the centre of the sphere

(c) at any angle to the conducting surface

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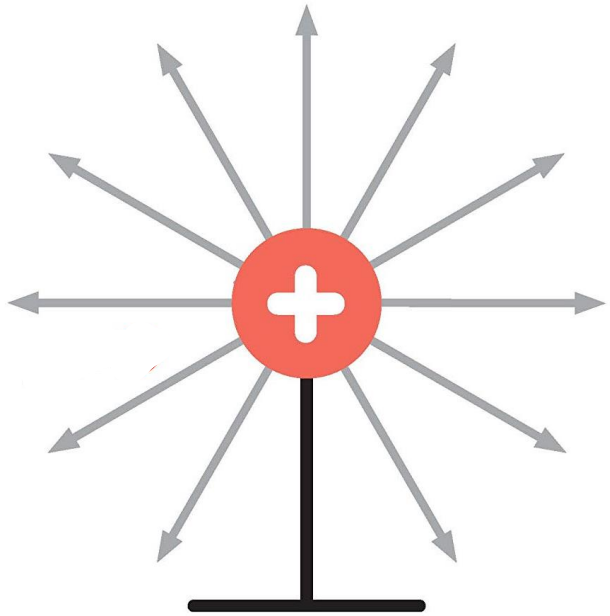

SSBCrack EXAMS

Q) The frequency of an alternating current is 3Hz. It implies that

(a) there are 6 cycles/s

(b) there are 3 cycles/s

(c) there are 2 cycles/s

(d) there is only 1 cycle/s

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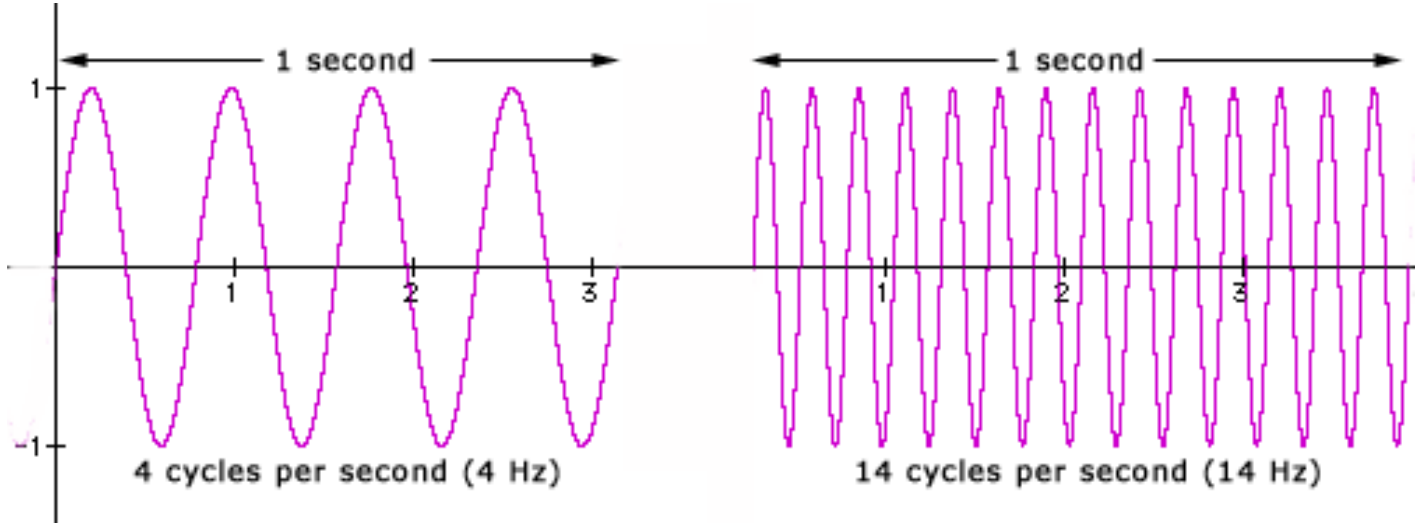

NDA 2 2022 - Physics Marathon

Q) Which one of the following correctly represents the SI unit of resistivity ?

(a) Ω

(b) Ω/m

(c) Ω cm

(d) Ω m

SSBCrack EXAMS

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(d) Ω m

$$R = \rho \frac{L}{A} \Rightarrow \rho = \frac{RA}{L}$$

$$In\ SI\ System\ of\ Unit$$

$$\rho = \frac{R\,\Omega\ \times A\,m^2}{L\,m}$$

$$\Rightarrow \rho = \frac{RA}{L}\ \ \frac{\Omega - m^2}{m}\ or\ \Omega - m$$

NDA 2 2022 - Physics Marathon

Q) What is the current required to light a 60 W incandescent bulb in a domestic supply of 240 V ?

(a) 0.5 A

(b) 0.25 A

(c) 1.0 A

(d) 5.0 A

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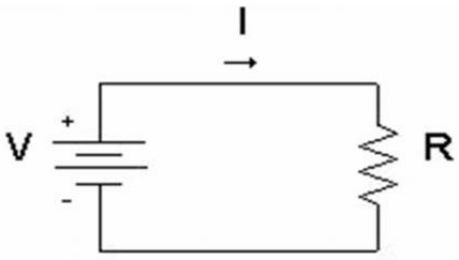

Basic Electrical Circuit

$$I = \frac{V}{R}$$

Ohm's Law

$P = V^2/R$

$R = V^2/P$

$R = 960$ ohm

$I = V/R$

$I = 240/960 = 0.25$ A

NDA 2 2022 - Physics Marathon

Q) The magnetic field produced by a current carrying straight wire at a point outside the wire depends

(a) inversely on the distance from it

(b) directly on the distance from it

(c) inversely at short distances and directly at large distances from it

(d) directly on the distance (at short distances) and inversely on the distance (at long distance) from it

SSBCrack EXAMS

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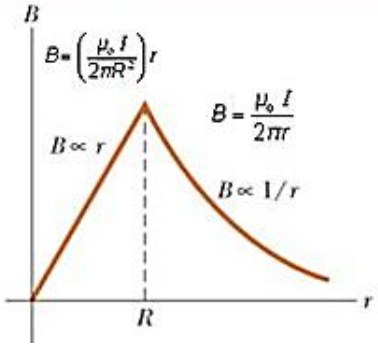
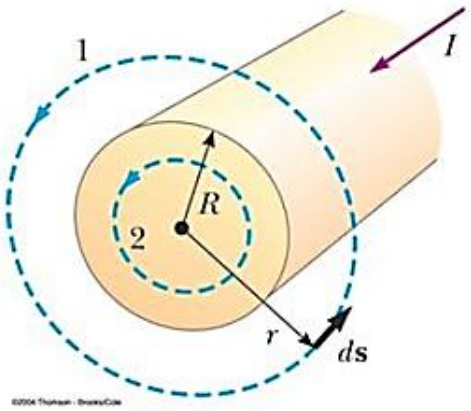
(d) directly on the distance (at short distances) and inversely on the distance (at long distance) from it

- The field is proportional to ***r*** inside the wire
- The field varies as **1/*r*** outside the wire
- Both equations are equal at ***r* = *R***





$$\int \mathbf{B} \cdot ds = \mu_0 I$$

NDA 2 2022 - Physics Marathon

Q) What is the dimension of gravitational constant?

(a) ML^3T^{-2}

(b) $M^{-1}L^3T^{-2}$

(c) $M^2L^{-2}T^{-2}$

(d) $M^2L^{-1}T^{-2}$

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Newton's law of universal gravitation

$$F = G\frac{m_1 m_2}{r^2}$$

F = force

G = gravitational constant

m_1 = mass of object 1

m_2 = mass of object 2

r = distance between centers of the masses

NDA 2 2022 - Physics Marathon

Q) A ball is thrown vertically upward with a speed of 40 m/s. The time taken by the ball to reach the maximum height would be approximately (take g = 10m/s^2)

(a) 2 s

(b) 3 s

(c) 4 s

(d) 5 s

SSBCrack EXAMS

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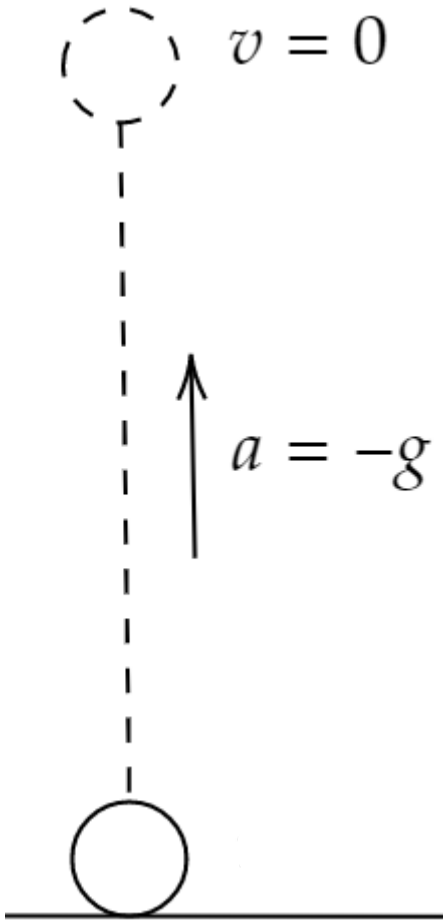

NDA 2 2022 - Physics Marathon

Q) The time period of a 1 m long pendulum approximates to

(a) 6 s

(b) 4 s

(c) 2 s

(d) 1 s

SSBCrack EXAMS

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$$T = 2\pi\sqrt{\frac{L}{g}}$$

NDA 2 2022 - Physics Marathon

Q) All objects experience a buoyancy when they are immersed in a fluid. Buoyancy is

(a) a downward force

(b) a downward pressure

(c) an upward force

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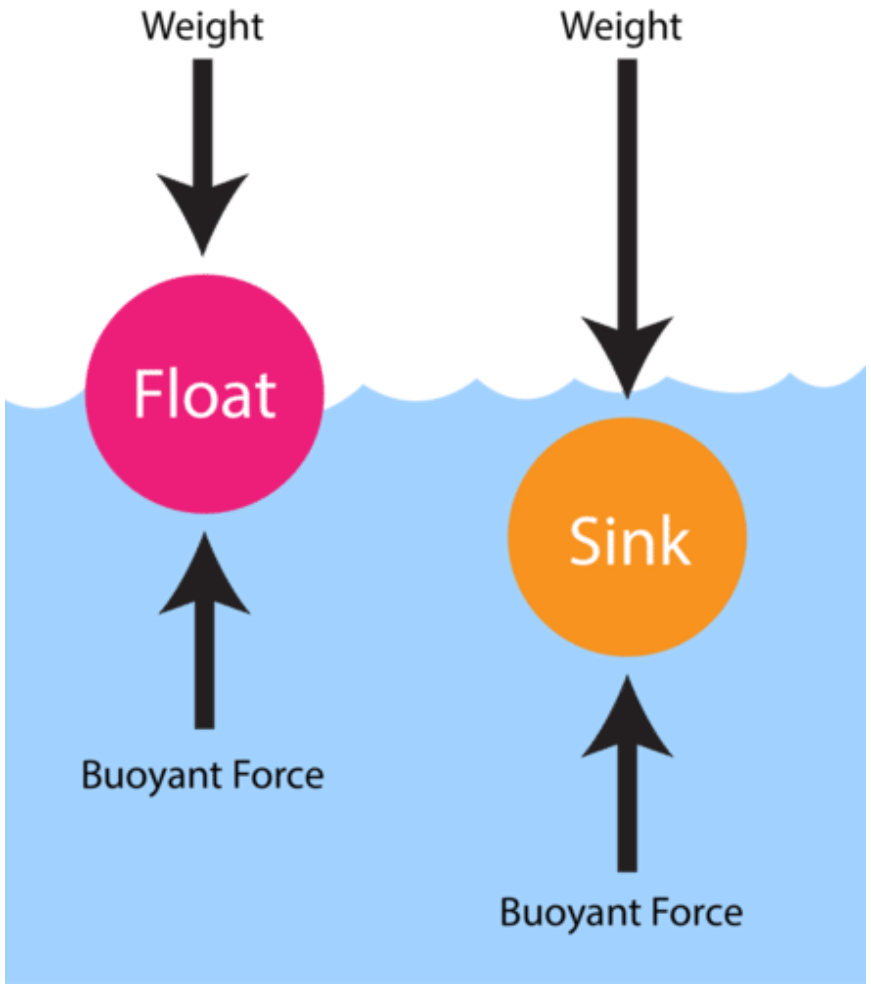

NDA 2 2022 - Physics Marathon

Q) According to Fleming's right-hand rule, if the forefinger indicates the direction of magnetic field in thumb show the direction of motion of conductor, then the stretched middle finger will predict the direction of

(a) force acting on the conductor

(b) electric field

(c) induced current

(d) current

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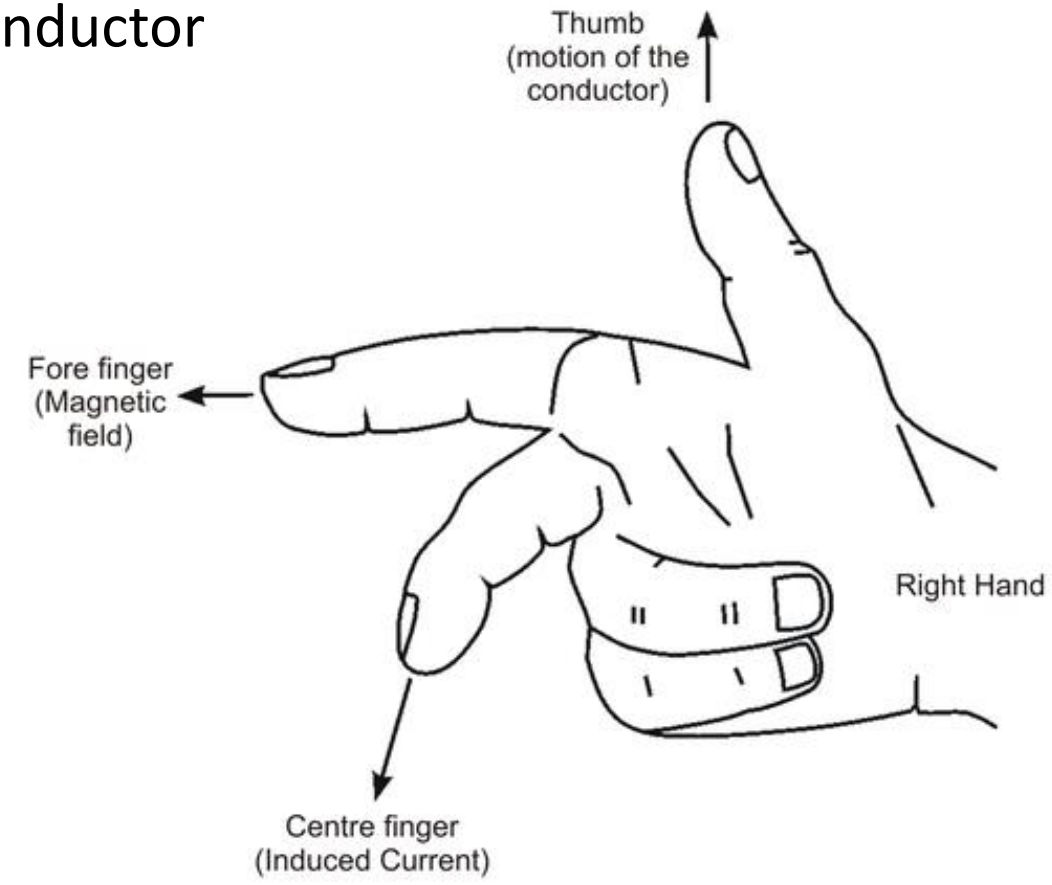
(d) current



NDA 2 2022 - Physics Marathon

Q) A temperature of 100 ^{o}F (Fahrenheit scale) is equal to T K (Kelvin scale). The value of T is

(a) 310.9

(b) 37.8

(c) 100

(d) 122.4

NDA 2 2022 - Physics Marathon

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(b) 37.8

(c) 100

(d) 122.4

We can write that,

$T(\circ C)=(T(\circ F)-32)\times 5/9$

It has been already mentioned in the question that the value of temperature in Fahrenheit scale can be written as,

$T(\circ F)=100\circ F$

Substituting the values in it will give,

$T(\circ C)=(100-32)\times 59=37.778\circ C$

Therefore, the temperature in degree Celsius scale equivalent to the temperature in degree Fahrenheit scale has been obtained. Now let us calculate the temperature in Kelvin scale.

$T(K)=T(\circ C)+273.15$

Therefore, we can substitute the value of temperature in Celsius scale

$T(K)=37.778+273.15=310.928K$

NDA 2 2022 - Physics Marathon

Q) What is the magnification produced by a concave lens of focal length 10cm, when an image is formed at a distance of 5 cm from the lens?

(a) 2.0

(b) 1.0

(c) 0.5

(d) 0.33

SSBCrack EXAMS

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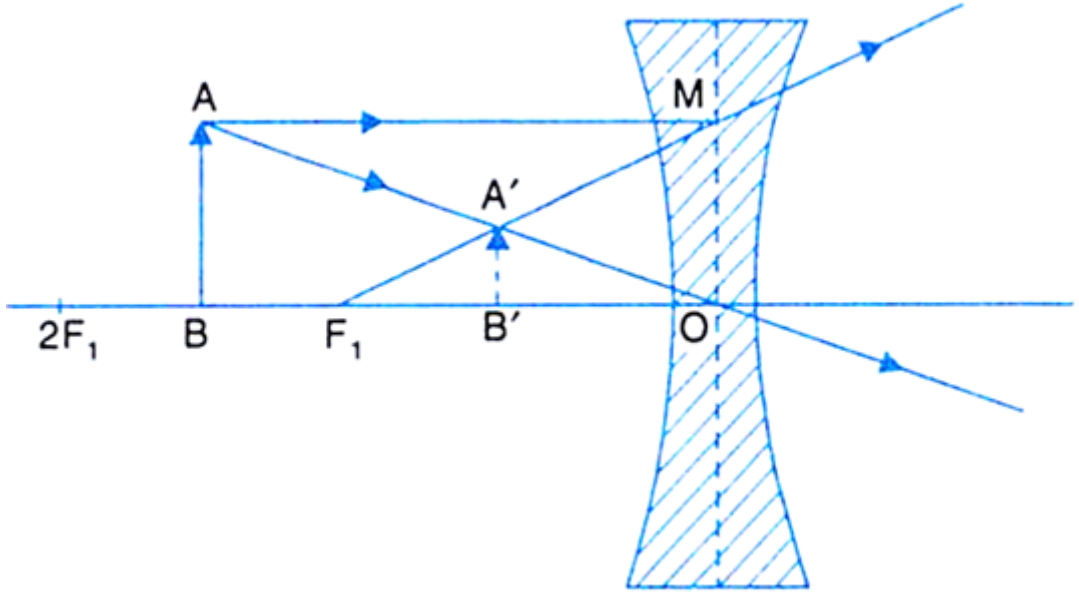

NDA 2 2022 - Physics Marathon

Q) A wooden box of mass 2 kg and dimensions (30 cm x 15 cm x 10 cm) is placed on a table with sides 30 cm and 10 cm touching the tabletop. Which one of the following is the approximate pressure exerted on the table?

(a) 111.1 N/m^2

(b) 222.2 N/m^2

(c) 333.3 N/m^2

(d) 666.6 N/m^2

SSBCrack EXAMS

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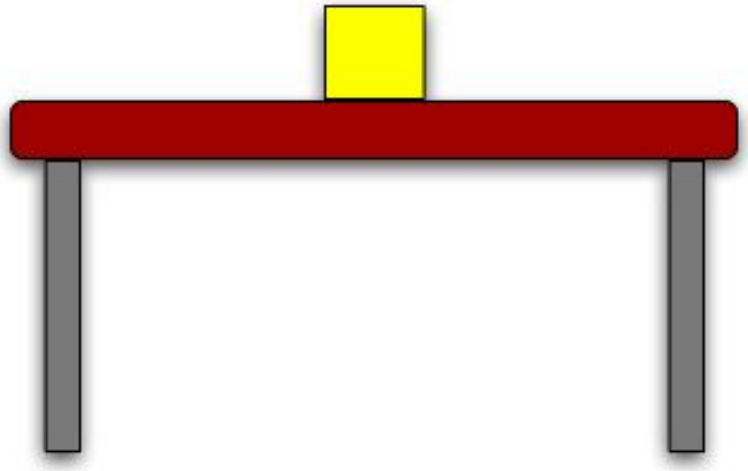

SSBCrack EXAMS

Q) Why are the tyres of aircrafts made of conducting rubber ?

1. So that the charge accumulated on the aircraft in flight, rubbing the air, can easily be transferred to the ground on landing.
2. So that the charge accumulated due to the operation of various electronic equipments in the aircraft in flight can easily be transferred to ground on landing

Select the correct answer using the code given below.

(a) 1 only

(b) 2 only

(c) Both 1 and 2

(d) Neither 1 nor 2

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The Reason Airplanes Use Conductive-Rubber Tires
Airplanes use tires made of conductive rubber to neutralize electricity. Electricity is created naturally through friction — and airplane tires are exposed to a lot of friction during takeoffs and landings

SSBCrack EXAMS

Q) In a group discussion on shape and size of the Earth, three students stated the following points :

1. Student 1: The shape of the earth is basically an oblate spheroid.
2. student 2: The polar diameter of the earth is more than the Equatorial diameter.
3. Student 3: Bulge along the Polar region is due to revolution of the Earth.

Who among the above students is/are correct?

(a) Student 1 only

(b) Student 1 and Student 2 only

(c) Student 2 and Student 3 only

(d) Student 1, Student 2 and Student 3

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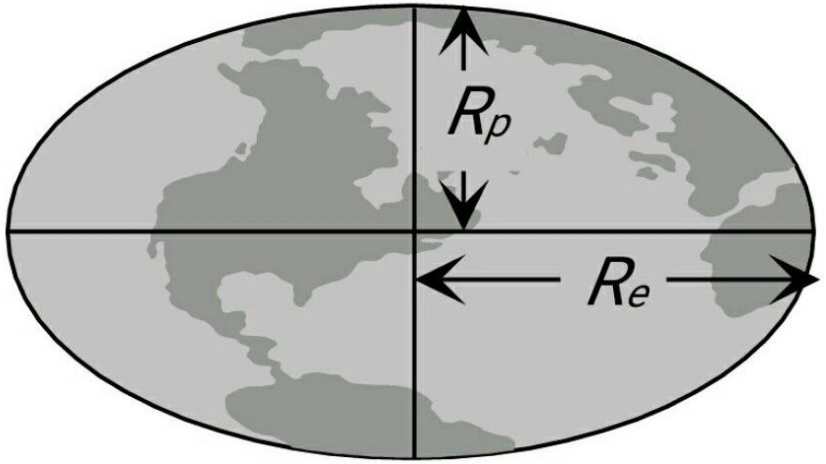

(a) Student 1 only

(b) Student 1 and Student 2 only

(c) Student 2 and Student 3 only

(d) Student 1, Student 2 and Student 3

NDA 2 2022 - Physics Marathon

Q) Which one of the following statements with respect to Global Positioning System (GPS) is ***not*** correct?

(a) It is based on network of satellites orbiting above the earth

(b) It is based on the system of triangulation

(c) GPS receivers provide location in terms of latitude, longitude and altitude

(d) It provides information exclusively for military operations

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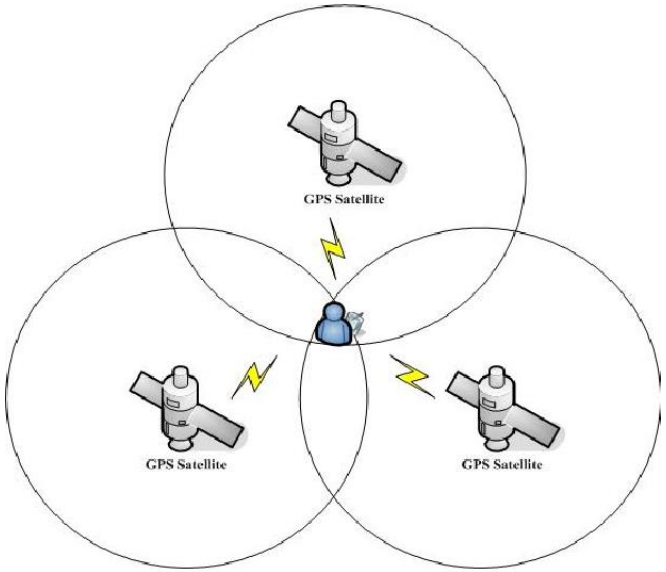

Fig. 1. The triangulation method of GPS

SSBCrack EXAMS

Q) Weight and mass of an object are defined with Newton's laws of motion. Which among the following is true?

(a) Weight is a constant of proportionality

(b) Mass is a constant of proportionality

(c) Mass is not a constant of proportionality

(d) Weight is a universal constant.

SSBCrack EXAMS

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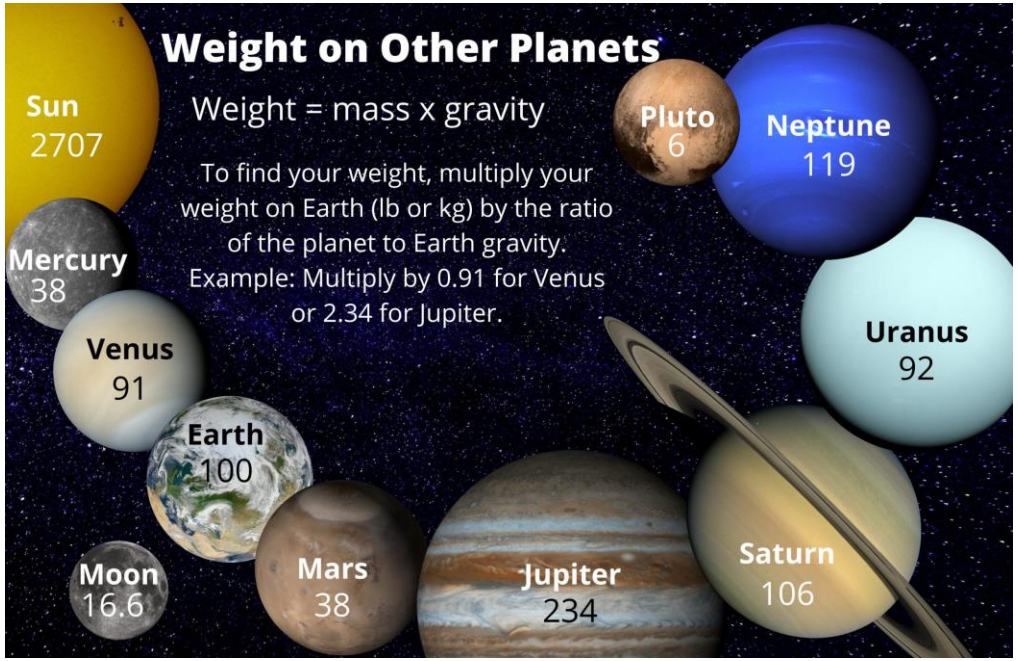

The weight of an object is defined as the force of gravity on the object and may be calculated as the mass times the acceleration of gravity, w = mg. Since the weight is a force, its SI unit is the newton. Thus, mass is a constant of proportionality.

SSBCrack EXAMS

Q) Fundamental laws of physics require

(a) conservation of energy and non-conservation of charge

(b) conservation of charge and non conservation of linear momentum

(c) conservation of charge and non-conservation of energy

(d) conservation of energy, momentum and charge

SSBCrack EXAMS

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(b) conservation of charge and non conservation of linear momentum

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Fundamental laws of physics require conservation of energy, momentum and Charge. With respect to classical physics, conservation laws include conservation of energy, mass (or matter), linear momentum, angular momentum, and electric charge. Most conservation laws are exact, or absolute, in the sense that they apply to all possible processes.

SSBCrack EXAMS

Q) Work is said to be one Joule when a force of

(a) 4 N moves an object by 25 cm

(b) 2 N moves an object by 1 m

(c) 1 N moves an object by 1 cm

(d) 1 N moves an object by 50 cm

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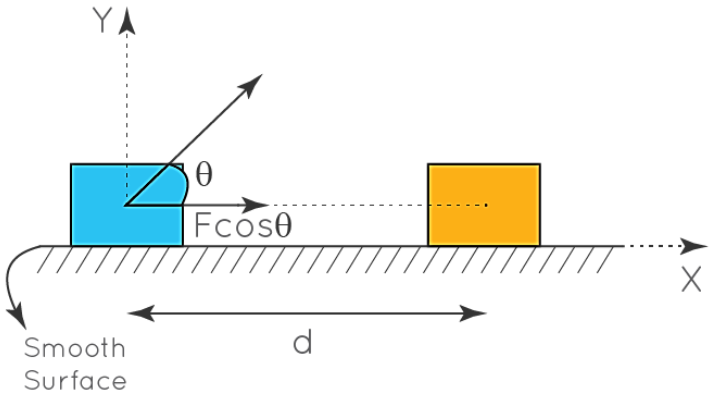

One joule is defined as the amount of work done when a force of one newton is exerted through a distance of one meter. Thus, force of 4 N moves an object by 25 cm resulting in 1 joule of work.

SSBCrack EXAMS

Q) A uniform motion of a car along a circular path experiences

(a) a change in speed due to a change in its direction of motion

(b) a change in velocity due to a change in its direction of motion

(c) a change in momentum due to no change in its direction of motion

(d) a constant momentum due to a change in its direction of motion

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Since velocity is a vector, changes in direction constitute changes in velocity. A change in velocity is known as acceleration. The change in velocity due to circular motion is known as centripetal acceleration.

SSBCrack EXAMS

Q) Three equal resistors are connected in parallel configuration in a closed electrical circuit. Then the total resistance in the circuit becomes

(a) one-third of the individual resistance

(b) two-third of the individual resistance

(c) equal to the individual resistance

(d) three times of the individual resistance

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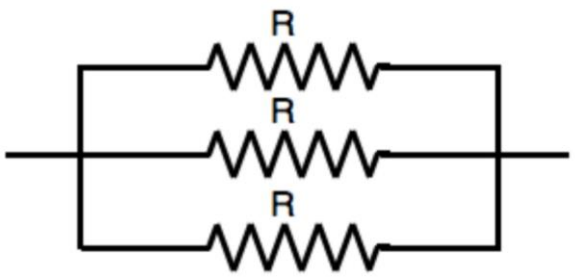

One-third of the individual resistance because if three or more resistors each with the same value are connected in parallel, then the equivalent resistance will be equal to R/n

SSBCrack EXAMS

Q) Rutherford's alpha-particle (α) scattering experiment was responsible for the discovery of which one of the following?

(a) Electron

(b) Proton

(c) Atomic Nucleus

(d) Neutron

SSBCrack EXAMS

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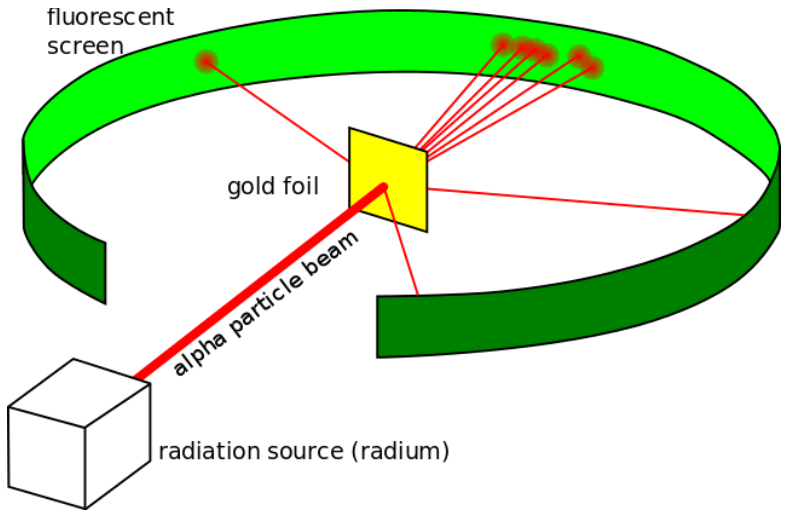

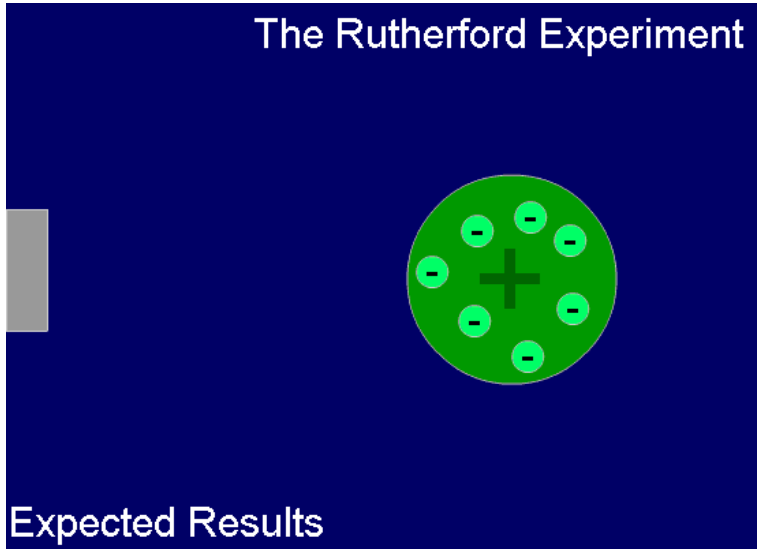

Ernest Rutherford's most famous experiment is the gold foil experiment. A beam of alpha particles was aimed at a piece of gold foil. Most alpha particles passed through the foil, but a few were scattered backward. This showed that most of the atom is empty space surrounding a tiny nucleus.

SSBCrack EXAMS

Q) Which one of the following elements' isotopes is used in the treatment of cancer?

(a) Iodine

(b) Sodium

(c) Cobalt

(d) Uranium

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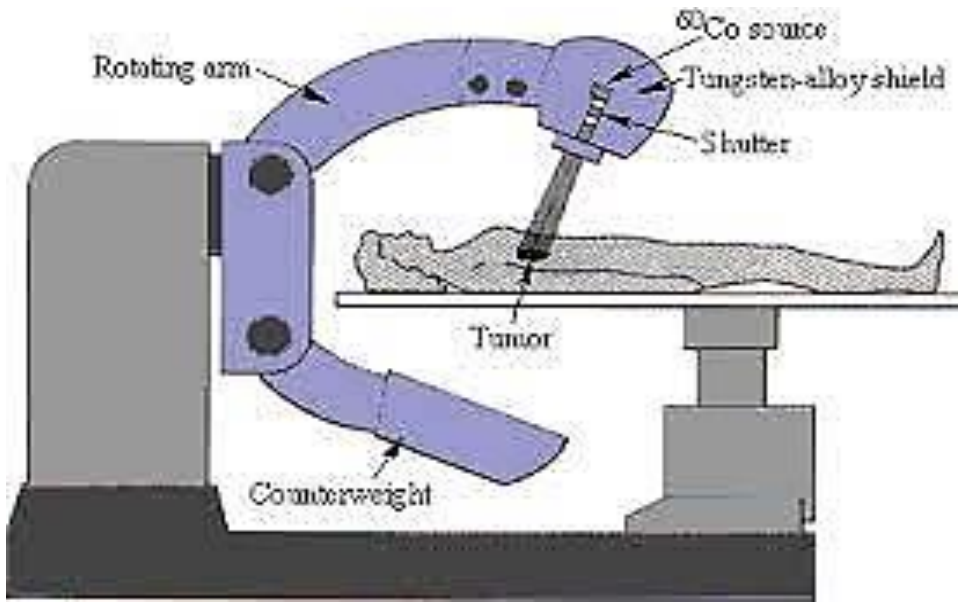

Cobalt therapy is the medical use of gamma rays from the radioisotope cobalt-60 to treat conditions such as cancer. Beginning in the 1950s, cobalt-60 was widely used in external beam radiotherapy (teletherapy) machines, which produced a beam of gamma rays that was directed into the patient's body to kill tumor tissue.

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SSBCrack EXAMS

Q) Imagine a current-carrying straight conductor with magnetic field of lines in anti-clockwise direction. Then the direction of current is determined by

(a) the Right-Hand Thumb rule and it would be in the downward direction.

(b) the Left-Hand Thumb rule and it would be in the downward direction.

(c) the Right-Hand Thumb rule and it would be in the upward direction.

(d) the Left-Hand Thumb rule and it would be in the upward direction.

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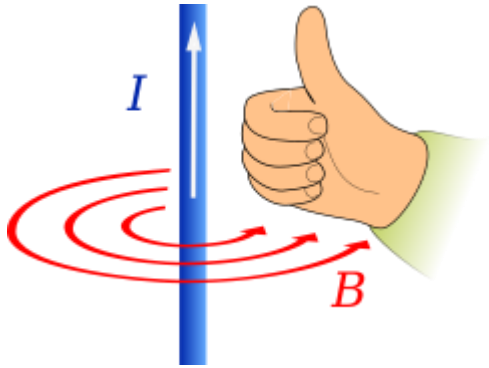
(b) the Left-Hand Thumb rule and it would be in the downward direction.

(c) the Right-Hand Thumb rule and it would be in the upward direction.

(d) the Left-Hand Thumb rule and it would be in the upward direction.

The right-hand thumb rule is used to find the direction of the magnetic field around a current carrying a straight conductor. Thus, a current-carrying straight conductor with the magnetic field of lines in the anti-clockwise direction would be in the upward direction according to the right-hand thumb rule.



SSBCrack EXAMS

Q) The device used to produce electric current is known as

(a) Motor

(b) Generator

(c) Ammeter

(d) galvanometer

SSBCrack EXAMS

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SSBCrack EXAMS

Q) Myopia is a defect in human vision where an image of a

(a)nearby object is focused beyond the retina.

(b) nearby object is focused before the retina.

(c) distant object is focused before the retina.

(d) distant object is focused beyond the retina.

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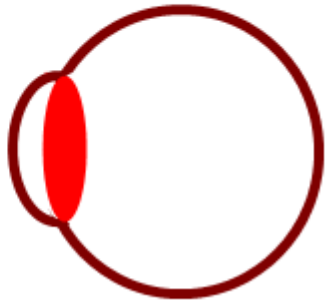
Myopia - defect and correction



Near sightedness (myopia) is a common vision condition in which you can see objects near to you clearly, but objects farther away are blurry.

NDA 2 2022 - Physics Marathon

Q) Plants get water through the roots because of

(a) Capillarity

(b) Viscosity

(c) Gravity

(d) Elasticity

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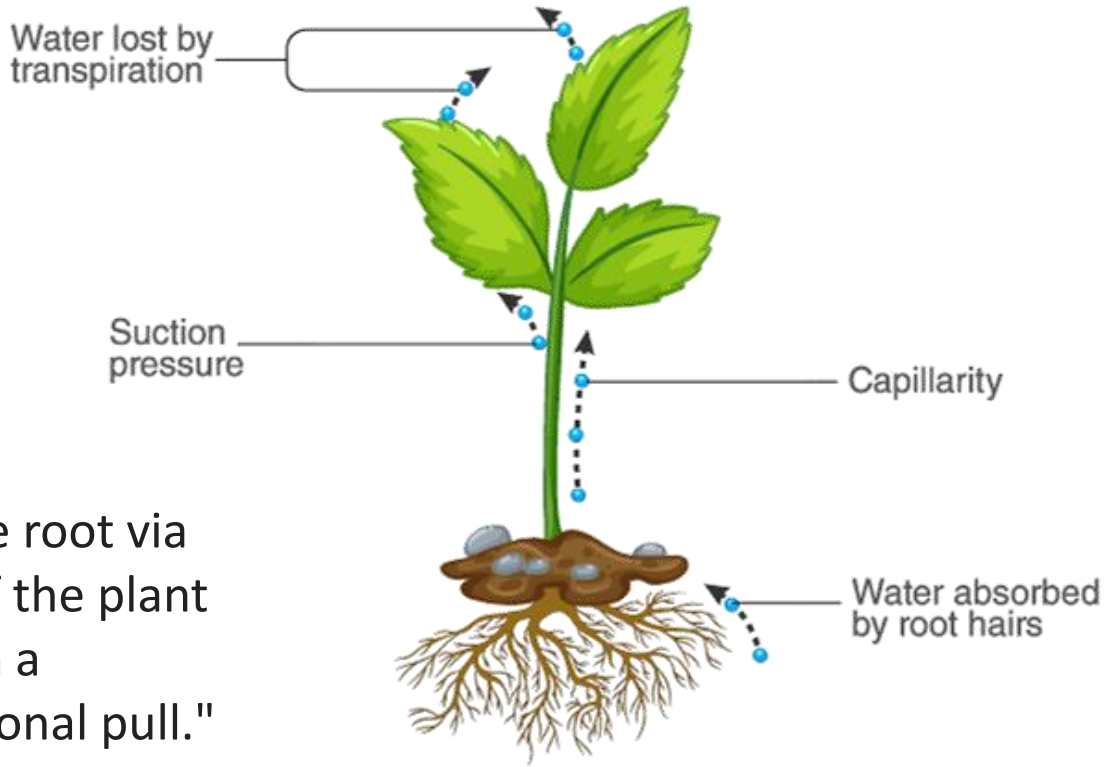

Plants absorb water from their root hairs on the root via osmosis. It is then transported to other parts of the plant (through the network of xylem vessels) through a combination of capillary action and "transiprational pull." Water moves through the plant by means of capillary action.

SSBCrack EXAMS

Q) Cornea in human eye

(a) is a light sensitive screen.

(b) is a muscular diaphragm.

(c) contains blood vessels.

(d) is composed of proteins and cells.

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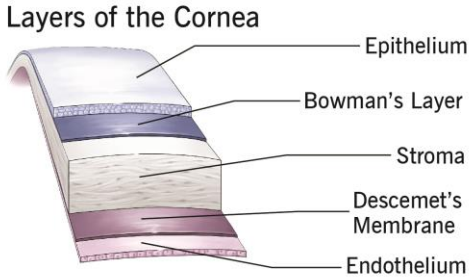

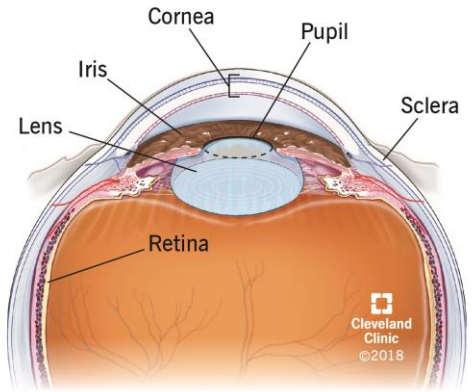

Cornea in human eye is composed of protein and cells. The cornea is made up of cellular and acellular components. The cellular components include the epithelial cells, keratocytes, and endothelial cells. The acellular component includes collagen and glycosaminoglycans. The epithelial cells are derived from epidermal ectoderm

SSBCrack EXAMS

Q) Power of a lens of focal length 25 cm is

(a)+ 2.5 Dioptre

(b) + 3 Dioptre

(c) + 4 Dioptre

(d) + 5 Dioptre

SSBCrack EXAMS

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(a)+ 2.5 Dioptre

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Power of lens = P

(measured in D - dioptres)

Focal length of lens = f

(measured in m - metres)

$$P = \frac{1}{f}$$

25 cm = 0.25 m

Now, substituting the value of focal length in the formula of power of lens we get $P = 1/0.25\mathrm{m}^{-1}$

$\Rightarrow P = 4\ \mathrm{m}^{-1}$

$\Rightarrow \mathrm{m}^{-1}$ is also expressed as diopters or D. As it is a convex lens, so its power is positive. Thus, the power of the lens is +4D.

SSBCrack EXAMS

Q) Spherical mirror formula relating an object distance '*u*', image distance '*v*' and focal length of mirror '*f*' may be applied to a plane mirror when

(a) focal length goes to infinity.

(b) focal length goes to zero.

(c) image distance goes to zero.

(d) image distance goes to infinity.

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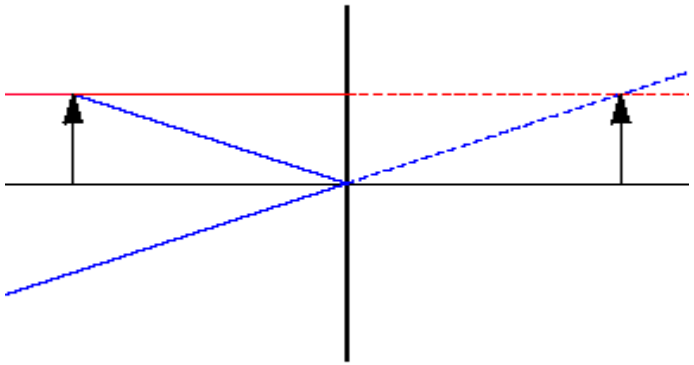

SSBCrack EXAMS

Q) Nuclear energy is generated by

(a) nuclear fission and its expression was proposed by Einstein.

(b) nuclear fission and its expression was proposed by Rutherford.

(c) nuclear fusion and its expression was proposed by Bohr.

(d) nuclear fusion and its expression was proposed by Heisenberg.

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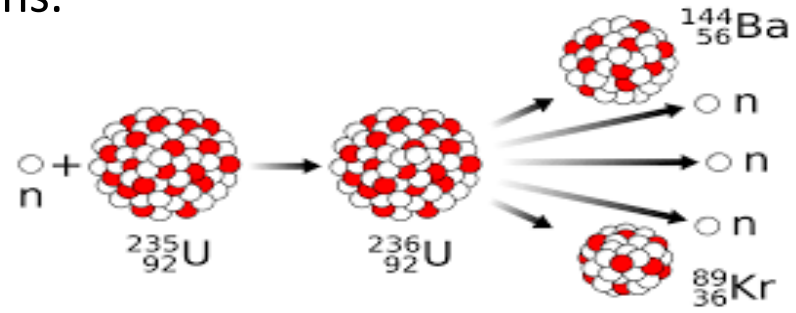
Nuclear energy is generated by nuclear fission and its expression was proposed by Rutherford. A nuclear reactor is driven by the splitting of atoms, a process called fission, where a particle (a 'neutron') is fired at an atom, which then fissions into two smaller atoms and some additional neutrons.



SSBCrack EXAMS

Q) Reverberation is a phenomenon associated with a

(a) multiple refraction of sound.

(b) multiple reflection of sound.

(c) single refraction of sound.

(d) single reflection of sound.

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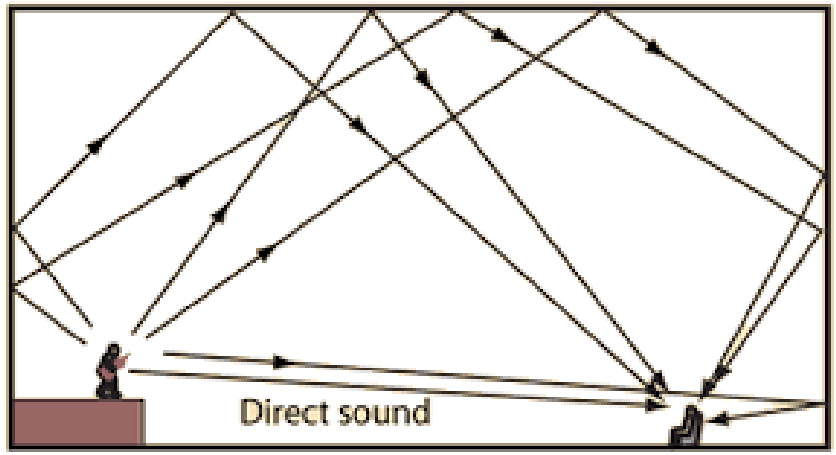

Reverberation is the phenomenon of persistence of sound after it has been stopped as a result of multiple reflections from surfaces such as furniture, people, air, etc.

SSBCrack EXAMS

Q) Which among the following is true for propagation of sound waves?

(a) Sound can travel in vacuum, and it is a transverse wave in air.

(b) Sound cannot travel in vacuum, and it is a longitudinal wave in air.

(c) Sound can travel in vacuum, and it is a longitudinal wave in air.

(d) Sound cannot travel in vacuum, and it is a transverse wave in air.

SSBCrack EXAMS

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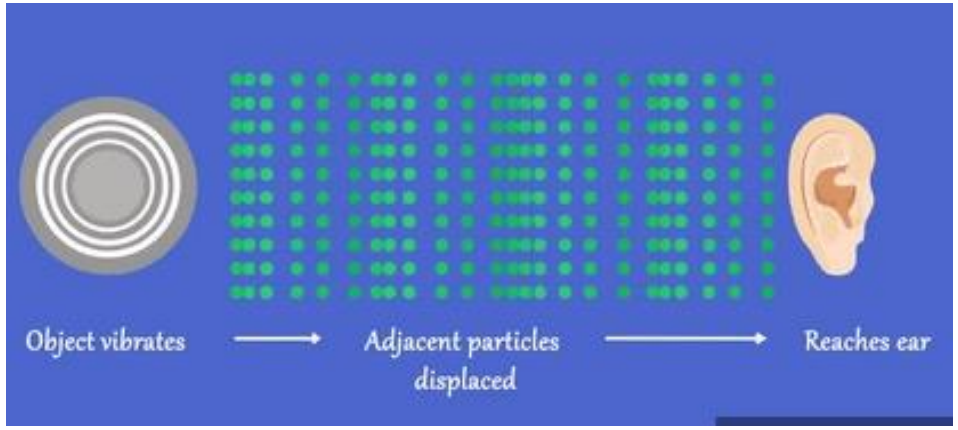
(d) Sound cannot travel in vacuum, and it is a transverse wave in air.

Sound cannot travel in vacuum, and it is a longitudinal wave in air. Sound propagates through air or other mediums as a longitudinal wave, in which the mechanical vibration constituting the wave occurs along the direction of propagation of the wave.



SSBCrack EXAMS

Q) A tennis ball is thrown in the vertically upward direction and the ball attains a maximum height of 20 m. The ball was thrown approximately with an upward velocity of

(a) 8 m/s

(b) 12 m/s

(c) 16 m/s

(d) 20 m/s

SSBCrack EXAMS

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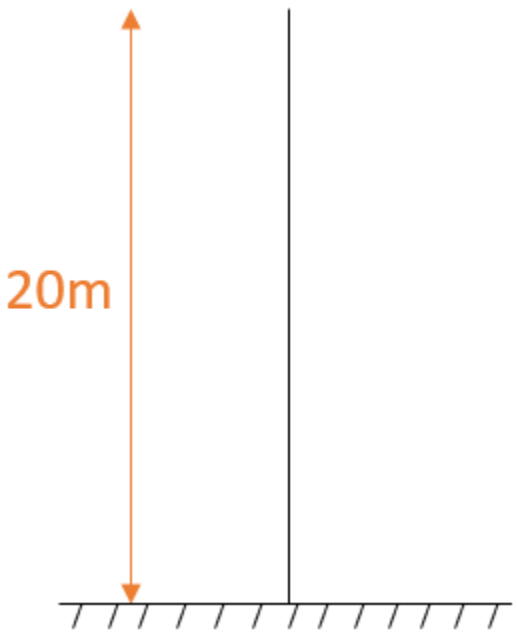
(c) 16 m/s

(d) 20 m/s



$$v^2 = u^2 - 2gs$$
$$0^2 = u^2 - 2gs$$
$$u^2 = 2gs$$

Here s=h=20m

And taking g=10m/s^2

We get

u=20m/s

SSBCrack EXAMS

Q) An object of mass 2000 g possesses 100 J kinetic energy. The object must be moving with a speed of

(a) 10.0 m/s

(b) 11.1 m/s

(c) 11.2 m/s

(d) 12.1 m/s

SSBCrack EXAMS

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(a) 10.0 m/s

(b) 11.1 m/s

(c) 11.2 m/s

(d) 12.1 m/s

According to formula,

$K = mv^2/2$

$100=2v^2/2$

$100=v^2$

$v = 10.0$ m/s

SSBCrack EXAMS

Q) The unit of the ratio between thrust and impulse is same as that of

(a) frequency

(b) speed

(c) wavelength

(d) acceleration

SSBCrack EXAMS

Q) The unit of the ratio between thrust and impulse is same as that of

(a) frequency

(b) speed

(c) wavelength

(d) acceleration

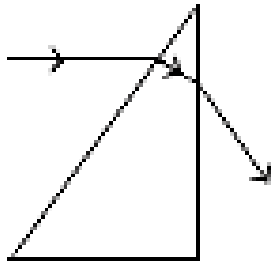
Thrust is [**MLT-2]** and the Dimension of Impulse is [MLT^{-1} **]**

Thrust is perpendicular force. Impulse is the integral of a force, F, over the time interval, t, for which it acts. Thus, the ratio of thrust i.e., F and Impulse would give time inverse which is equivalent to Frequency.

SSBCrack EXAMS

Q) Which one of the following figures correctly shows the path of a ray of light through a glass prism?

(a)



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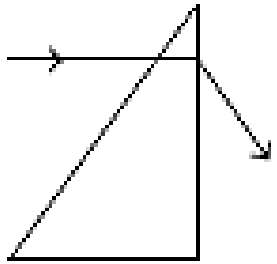
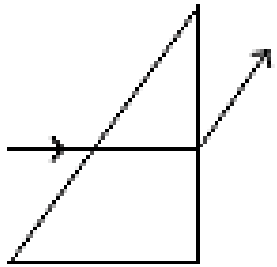
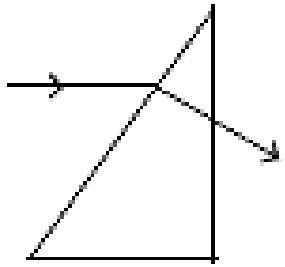


(c)



(d)



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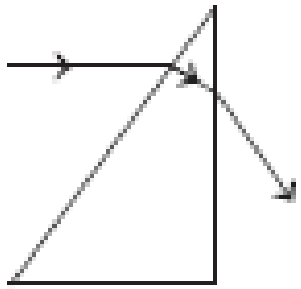

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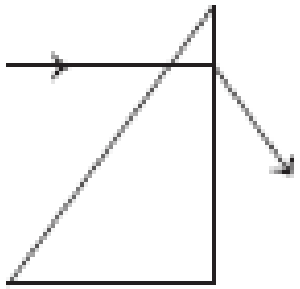
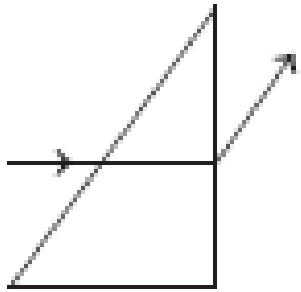
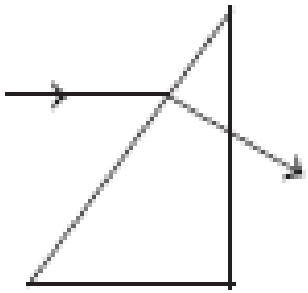


(c)



(d)



Ans (a)

A ray of light through a glass prism as it shows the rays moving towards normal while going from rarer to denser medium and away from normal while moving from denser to rarer medium.

SSBCrack EXAMS

Q) When a light beam falls on a triangular glass prism, a band of colors is obtained. Which one of the following statements is correct in this regard?

(a) Red light bends the most, as the refractive index of glass for red light is greatest.

(b) Red light bends the most, as the refractive index of glass for red light is lowest.

(c) Violet light bends the most, as the refractive index of glass for violet light is greatest.

(d) Violet light bends the most, as the refractive index of glass for violet light is lowest.

SSBCrack EXAMS

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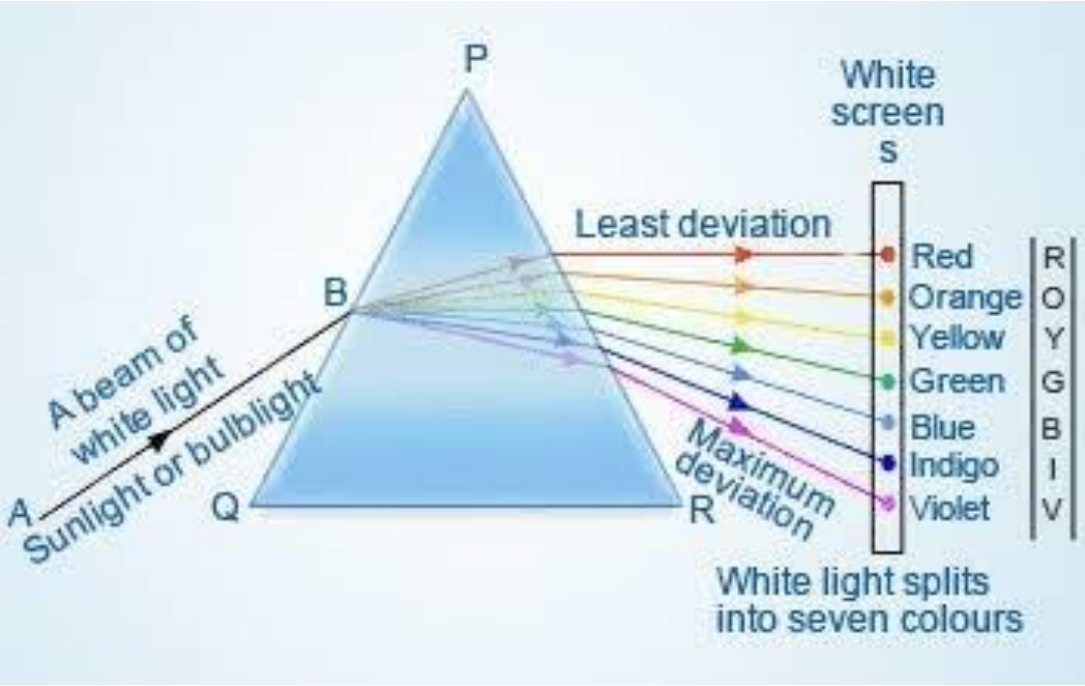

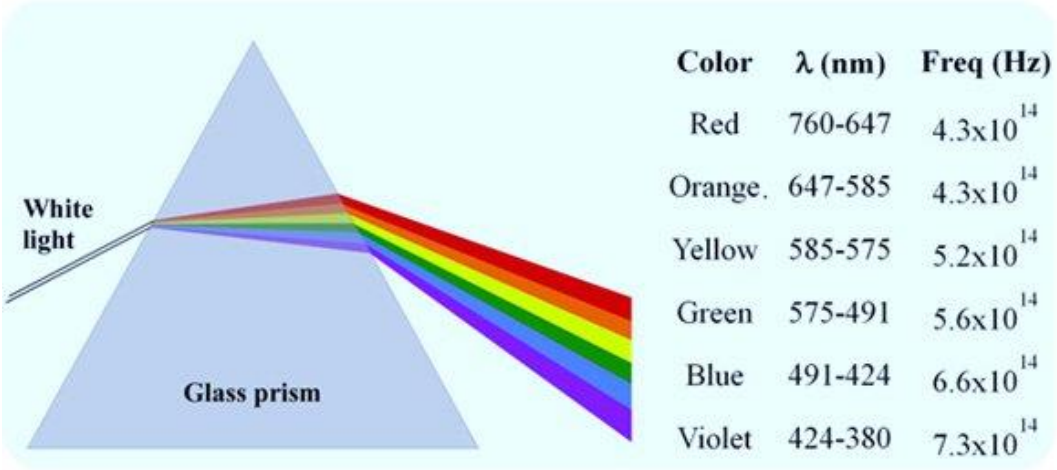

Ans (c) Violet light bends the most, as the refractive index of glass for violet light is greatest.

SSBCrack EXAMS

Q) The image of an object formed by a plane mirror is

(a) erect, real and larger.

(b) erect, virtual and same size.

(c) inverted, virtual and same

(d) inverted, real and smaller.

SSBCrack EXAMS

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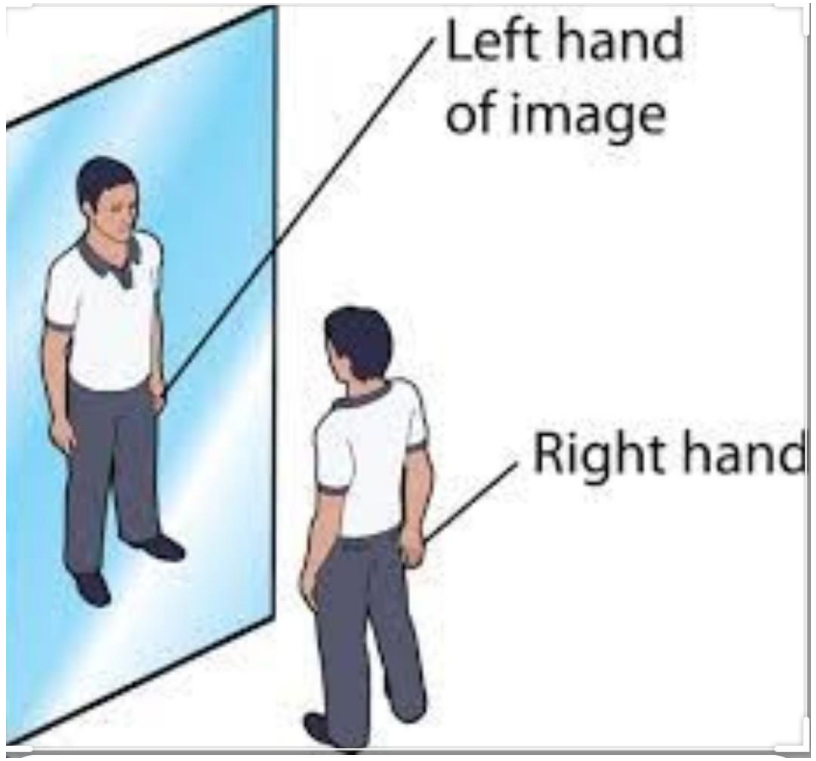

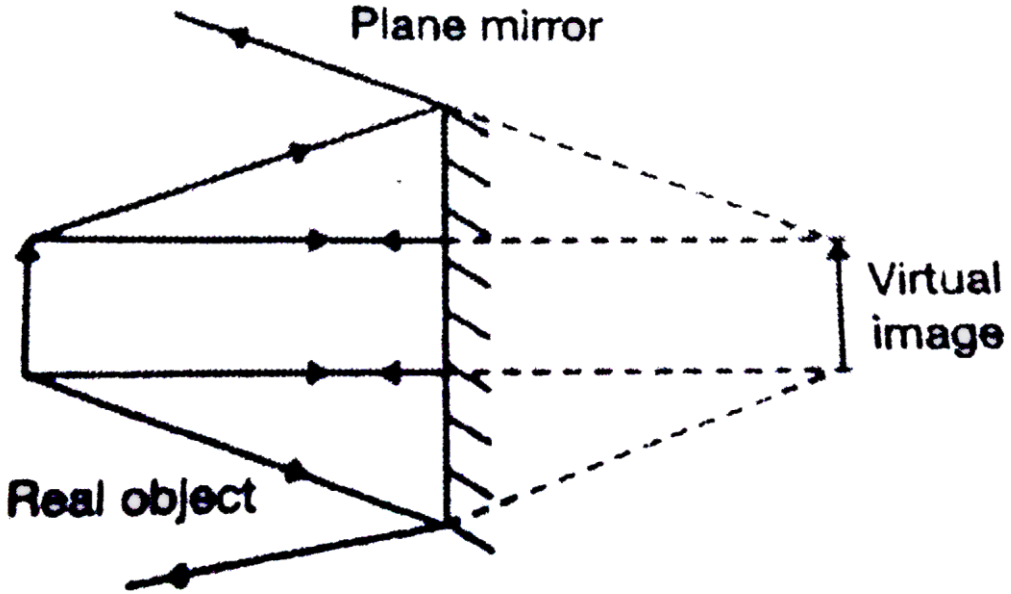

SSBCrack EXAMS

Q) Which one of the following is not a conservative force?

(a) Frictional force

(b) Electric force

(c) Gravitational force

(d) Spring force

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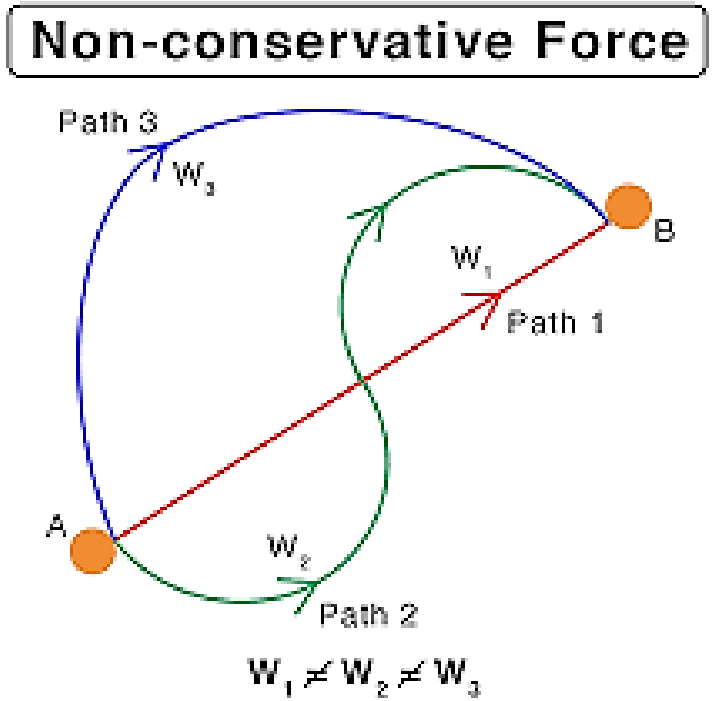

SSBCrack EXAMS

Q) A negative work is done when an applied force F and the corresponding displacement S are

(a) perpendicular to each other.

(b) parallel to each other.

(c) anti-parallel to each other.

(d) equal in magnitude.

SSBCrack EXAMS

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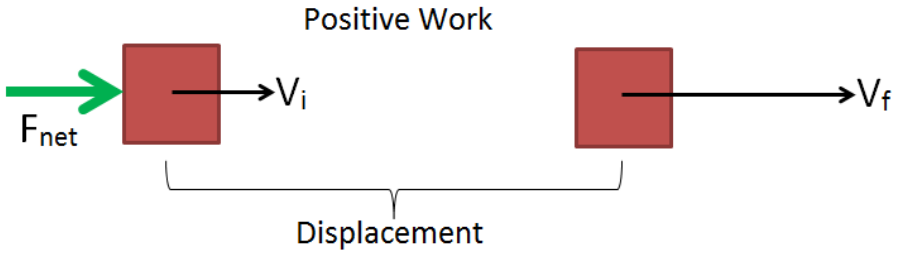

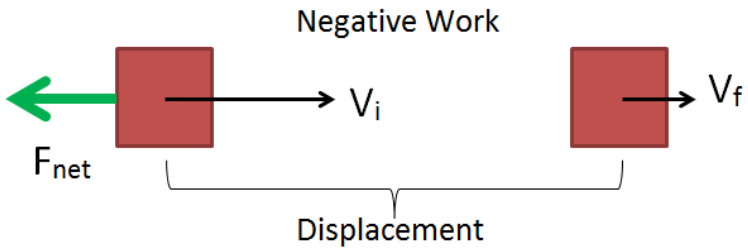

The work W that a force F does on an object is the product of the magnitude F of the force, times the magnitude d of the displacement, times the cosine of the angle θ between them.

$W = fd \cos \theta$

So, if angle is 180^0, W will be negative.

NDA 2 2022 - Physics Marathon

Q) What would be the displacement of a particle moving in a circular path of radius r after a displacement of half a circle?

(a) $2\pi r$

(b) πr

(c) $2r$

(d) Zero

NDA 2 2022 - Physics Marathon

Q) What would be the displacement of a particle moving in a circular path of radius r after a displacement of half a circle?

(a) $2\pi r$

(b) πr

(c) 2r

(d) Zero

After half a circle, the particle will be diametrically opposite to its origin. Hence, displacement is equal to the diameter.

NDA 2 2022 - Physics Marathon

Q) Velocity is defined as _____ per time.

(a) distance

(b) displacement

(c) power

(d) acceleration

NDA 2 2022 - Physics Marathon

Q) Velocity is defined as _____ per time.

(a) distance

(b) displacement

(c) power

(d) acceleration

Velocity is defined as displacement per unit time.

NDA 2 2022 - Physics Marathon

Q) Which of the following is true of a free-falling body?

(a) It moves with non-uniform motion

(b) It has zero velocity

(c) It has constant non-zero acceleration

(d) It has non-uniform acceleration

SSBCrack EXAMS

Q) Which of the following is true of a free-falling body?

(a) It moves with non-uniform motion

(b) It has zero velocity

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(d) It has non-uniform acceleration

When a body falls freely it is said to be in constant acceleration. The body does not have any force acting on it other than the acceleration due to gravity. Thus, acceleration also remains constant in the complete duration of the fall.

NDA 2 2022 - Physics Marathon

Q) The physical quantity that has both magnitude and direction is known as

(a) Vectors

(b) Scalars

(c) Both(a) and (b)

(d) Neither (a) or (b)

NDA 2 2022 - Physics Marathon

Q) The physical quantity that has both magnitude and direction is known as

(a) Vectors

(b) Scalars

(c) Both(a) and (b)

(d) Neither (a) or (b)

Vector quantities are physical quantities that have both magnitude and direction.

NDA 2 2022 - Physics Marathon

Q) Which of the following situations is true and possible?

(a) If the velocity of a body is zero, then the acceleration can be non-zero

(b) A body moving at a constant velocity can have acceleration

(c) The magnitude of distance and displacement are equal in a circular motion

(d) All of the above

NDA 2 2022 - Physics Marathon

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(b) A body moving at a constant velocity can have acceleration

(c) The magnitude of distance and displacement are equal in a circular motion

(d) All of the above

It is possible to have a non-zero value of acceleration when the velocity of a body is zero. When the body is projected vertically up, at the highest point its speed becomes zero whereas it is accelerating downwards with $g = 9.8\ m/s^2$

NDA 2 2022 - Physics Marathon

Q) Loudness measures the sound energy reaching the ear per second and depends on the amplitude of the sound wave. What is the unit used to measure the loudness of sound?

(a) hertz

(b) decibel

(c) meter/second

(d) second

NDA 2 2022 - Physics Marathon

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(a) hertz

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(c) meter/second

(d) second

We measure loudness or sound intensity (also referred to as sound power or sound pressure) in units called decibels. **Decibels (dB)**

NDA 2 2022 - Physics Marathon

Q) If a wave complete 20 vibration in 2.5s, then its frequency is _____

(a) 200 Hz

(b) 50 Hz

(c) 20 Hz

(d) 8 Hz

NDA 2 2022 - Physics Marathon

Q) If a wave complete 20 vibration in 2.5s, then its frequency is _____

(a) 200 Hz

(b) 50 Hz

(c) 20 Hz

(d) 8 Hz

Number of vibration per second is the frequency.
So, frequency = 20/2.5 = 8 Hz

NDA 2 2022 - Physics Marathon

Q) When sound gets reflected from a surface

(a) the angle of incidence < angle of reflection

(b) the angle of incidence = the angle of reflection

(c) the angle of reflection is equal to 90°

(d) the angle of incidence > angle of reflection

SSBCrack EXAMS

Q) When sound gets reflected from a surface

(a) the angle of incidence < angle of reflection

(b) the angle of incidence = the angle of reflection

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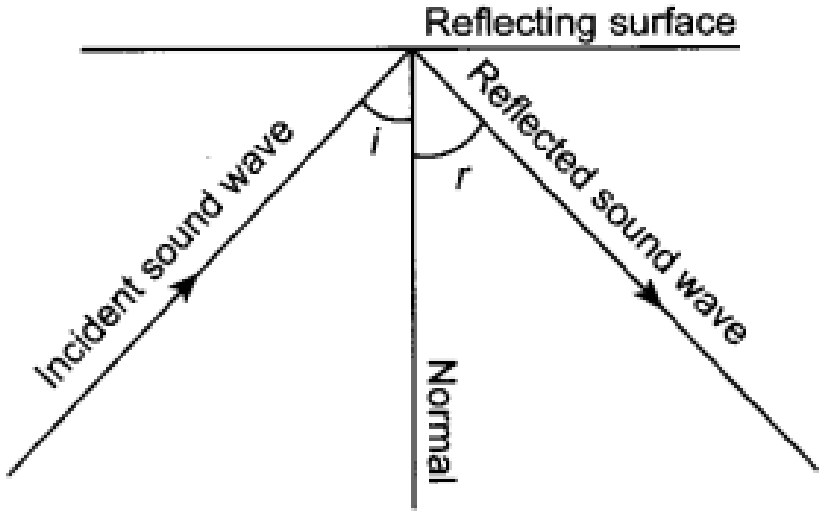
From the laws of Reflection of sound, we can say that
•The angle of reflection is always equal to the angle of incidence.



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Q) Loudness or softness of a sound is depends on _____

(a) Amplitude

(b) Frequency

(c) Type of a wave

(d) None of these

NDA 2 2022 - Physics Marathon

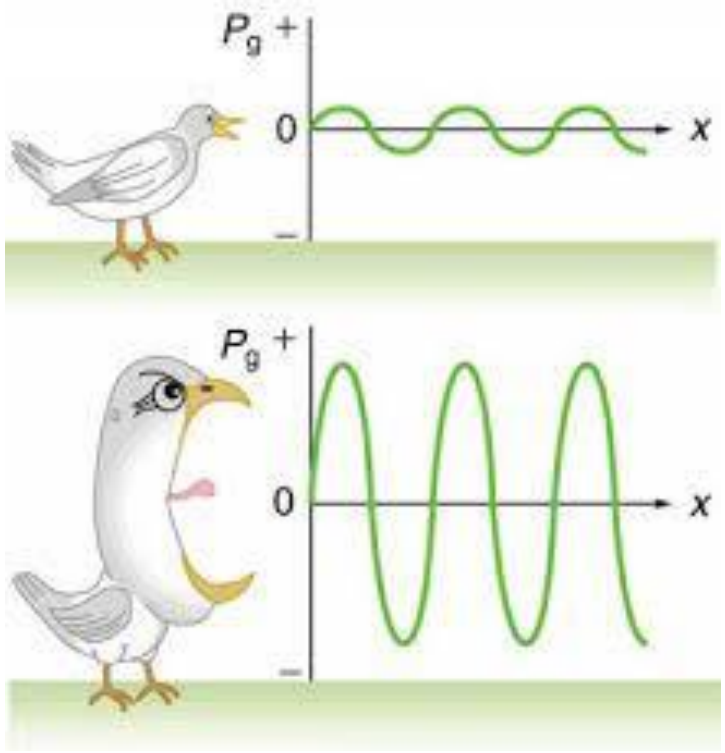
Q) Loudness or softness of a sound is depends on _____

(a) Amplitude

(b) Frequency

(c) Type of a wave

(d) None of these



NDA 2 2022 - Physics Marathon

Q) The speed of sound is greater in_____

(a) Nickel

(b) Ethanol

(c) Air

(d) Sulphur dioxide

SSBCrack EXAMS

Q) The speed of sound is greater in_____

(a) Nickel

(b) Ethanol

(c) Air

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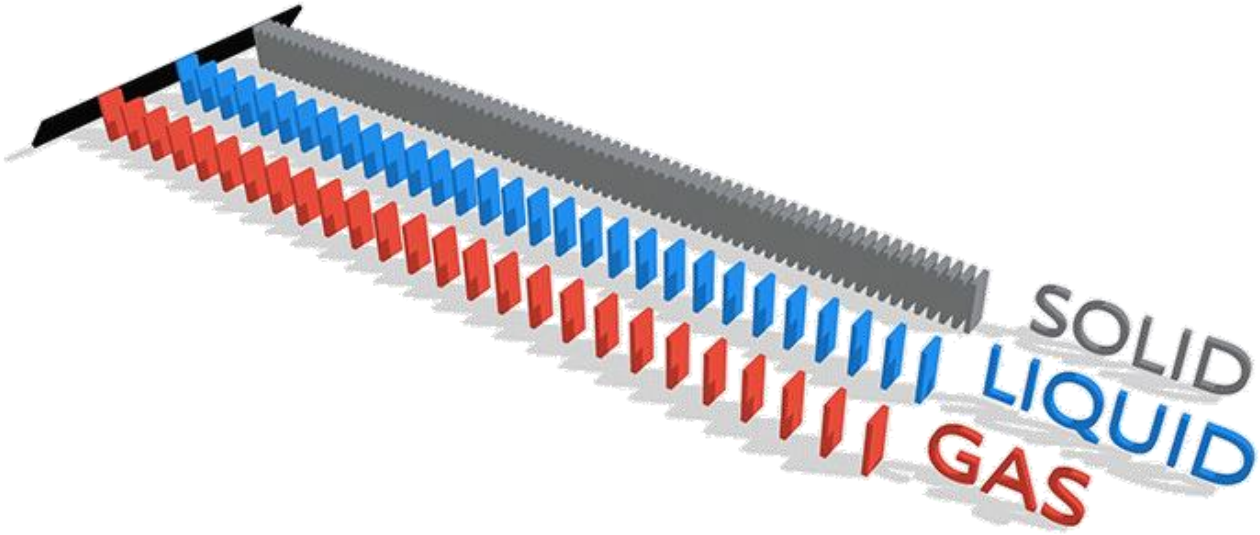

Speed of sound is maximum in **solids** and decreases from solids to liquids and liquids to gases. Sound can't travel through a vacuum.

NDA 2 2022 - Physics Marathon

Q) An apple falls from a tree because of gravitational attraction between the Earth and the apple. If F1 is the magnitude of force exerted by the Earth on the apple and F2 is the magnitude of force exerted by the apple on the Earth, then

(a) F1 is very much greater than F2

(b) F2 is very much greater than F1

(c) F1 is only a little greater than F2

(d) F1 and F2 are equal

NDA 2 2022 - Physics Marathon

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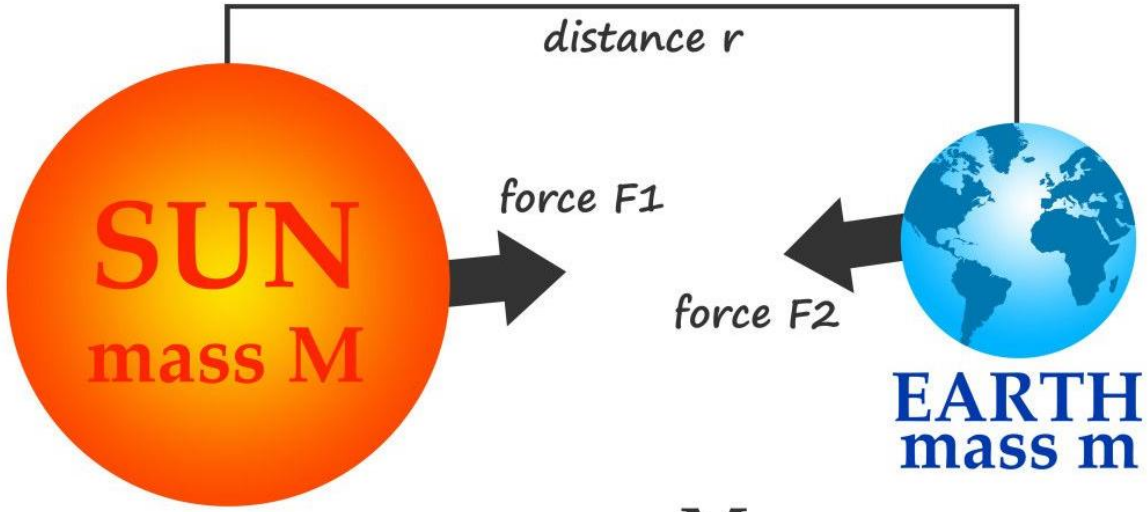

$$F1 = F2 = G\frac{M \times m}{r^2}$$

NDA 2 2022 - Physics Marathon

Q) When a mango falls from a mango tree then

(a) only the Earth attracts the mango.

(b) only the mango attracts the Earth.

(c) both the mango and the Earth attract each other.

(d) both the mango and the Earth repel each other.

NDA 2 2022 - Physics Marathon

Q) When a mango falls from a mango tree then

(a) only the Earth attracts the mango.

(b) only the mango attracts the Earth.

(c) both the mango and the Earth attract each other.

(d) both the mango and the Earth repel each other.

The gravitational force is always attractive in nature.

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Q) When a ship floats in sea water

(a) The weight of water displaced is greater than the weight of ship

(b) The weight of water displaced is less than the weight of the ship

(c) The weight of water displaced is equal to the weight of the ship

(d) It displaces no water.

NDA 2 2022 - Physics Marathon

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(b) The weight of water displaced is less than the weight of the ship

(c) The weight of water displaced is equal to the weight of the ship

(d) It displaces no water.

According to Archimedes principle when a body is immersed fully or partially in a liquid it experiences an upward force that is equal to the weight of the fluid displaced by it therefore the weight of water displaced is equal to the weight of the ship.

NDA 2 2022 - Physics Marathon

Q) The SI unit of pressure is

(a) Nm^2

(b) N/m

(c) N/m^2

(d) N^2/m^2

NDA 2 2022 - Physics Marathon

Q) The SI unit of pressure is

(a) Nm^2

(b) N/m

(c) N/m^2

(d) N^2/m^2

P=F/A

So, the unit is N/m^2

NDA 2 2022 - Physics Marathon

Q) If the gravitational attraction of the Earth suddenly disappears, which of the following statements will be true?

(a) The weight of body will become zero, but the mass will remain same.

(b) The weight of a body will remain same, but the mass will become zero.

(c) Both mass and weight become zero.

(d) Neither mass nor weight becomes zero.

NDA 2 2022 - Physics Marathon

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(c) Both mass and weight become zero.

(d) Neither mass nor weight becomes zero.

If the gravitational force on earth disappears, then there would be no acceleration acting on a body downwards, hence, there will be no force acting on the body due to gravity, hence, **the weight of the body will become zero.**

NDA 2 2022 - Physics Marathon

Q) The masses of two bodies are in ratio 5 : 6 and their velocities are in ratio 1 : 2. Then their linear momentum will be in the ratio

(a) 5 : 6

(b) 1 : 2

(c) 12 : 5

(d) 5 : 12

NDA 2 2022 - Physics Marathon

Q) The masses of two bodies are in ratio 5 : 6 and their velocities are in ratio 1 : 2. Then their linear momentum will be in the ratio

(a) 5 : 6

(b) 1 : 2

(c) 12 : 5

(d) 5 : 12

$m_1/m_2 = 5/6$
$v_1/v_2 = 1/2$
Using the formula,
Given that,
Mass (m) = 5/6
Velocity (v) = 1/2
Substituting their values,
$\Rightarrow p = mv$
$\Rightarrow p = (5/6) \times (1/2)$
$\Rightarrow (5 \times 1) / (6 \times 2)$
$\Rightarrow 5/12 = 5 : 12$
Therefore, the ratio of linear momentum of the two bodies is (d) 5 : 12.

NDA 2 2022 - Physics Marathon

Q) Which of the following is the SI units of force?

(a) Kgm/s^2

(b) Kgm/s

(c) Newton - metre

(d) Newton

NDA 2 2022 - Physics Marathon

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(a) Kgm/s^2

(b) Kgm/s

(c) Newton - metre

(d) Newton

NDA 2 2022 - Physics Marathon

Q) A bullet of mass 5 gm is fired from a gun of mass 5 kg. What is the recoil of the of gun if muzzle velocity is 500 m/s.

(a) 500 m/s

(b) 5 m/s

(c) 50 m/s

(d) 0.5 m/s

SSBCrack EXAMS

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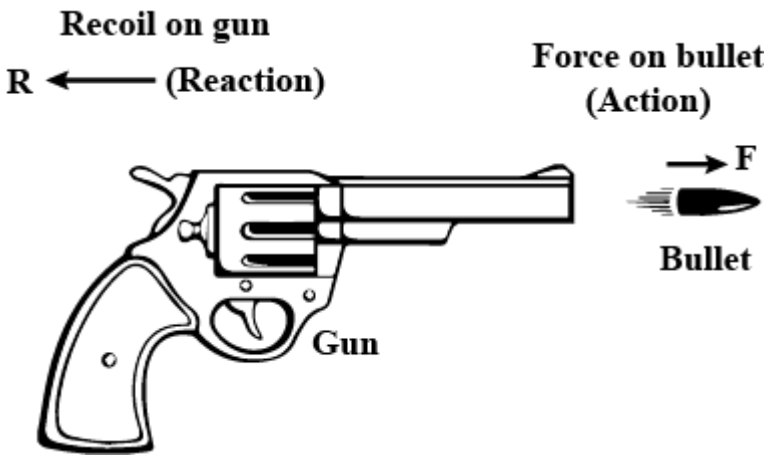

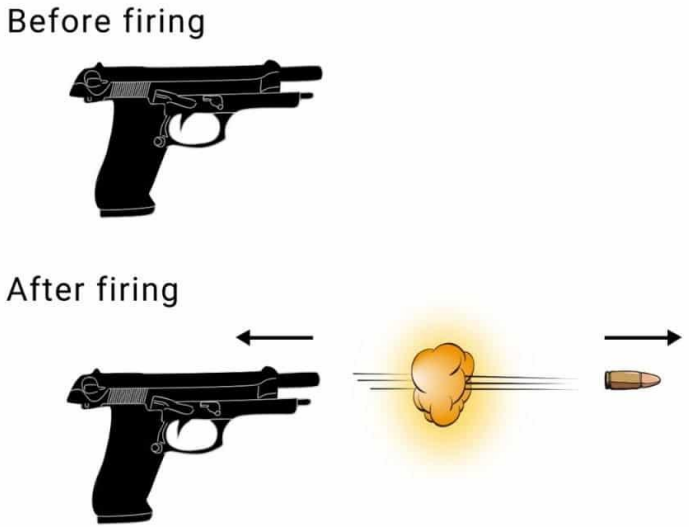

By the conservation of linear momentum $m_B v_B = m_a v_a$

$$\Rightarrow v_G = \frac{m_B \times v_B}{m_G} = \frac{5 \times 10^{-3} \times 500}{5} = 0.5 \text{ m/s}$$

Q) A plate, a ball, and a child all have the same mass. The one having more inertia is the

(a) plate

(b) ball

(c) child

(d) All have equal inertia

NDA 2 2022 - Physics Marathon

Q) A plate, a ball, and a child all have the same mass. The one having more inertia is the

(a) plate

(b) ball

(c) child

(d) All have equal inertia

Inertia depends upon the mass of the object. If the mass of a body is more, it will have more inertia. As the mass of the plate, all and the child is the same, they all will have the same inertia

NDA 2 2022 - Physics Marathon

Q) A man throws a ball weighing 200 g vertically upwards with a speed of 10m/s. Its momentum at the highest point of its flight will be:

(a) 2 kg m/s

(b) 2000 kg m/s

(c) Insufficient data to find the momentum.

(d) zero

NDA 2 2022 - Physics Marathon

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(a) 2 kg m/s

(b) 2000 kg m/s

(c) Insufficient data to find the momentum.

(d) zero

At the highest point, velocity is zero. Hence, the momentum is also zero.

NDA 2 2022 - Physics Marathon

Q) A monkey is climbing up a rope, then the tension in the rope

(a) must be equal to the force applied by the monkey on the rope

(b) must be less than the force applied by the monkey on the rope

(c) must be greater than the force applied by the monkey on the rope

(d) maybe equal to less than or greater the force applied by the monkey on the rope

SSBCrack EXAMS

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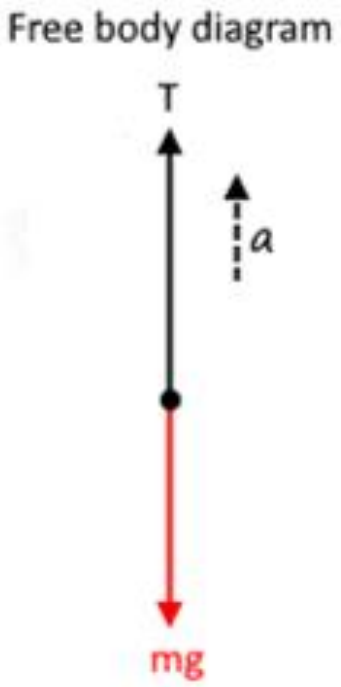

NDA 2 2022 - Physics Marathon

Q) The horizontal range of the projectile is maximum when the angle of projection is

(a) 90^0

(b) 0^0

(c) 45^0

(d) 30^0

SSBCrack EXAMS

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(a) 90^0

(b) 0^0

(c) 45^0

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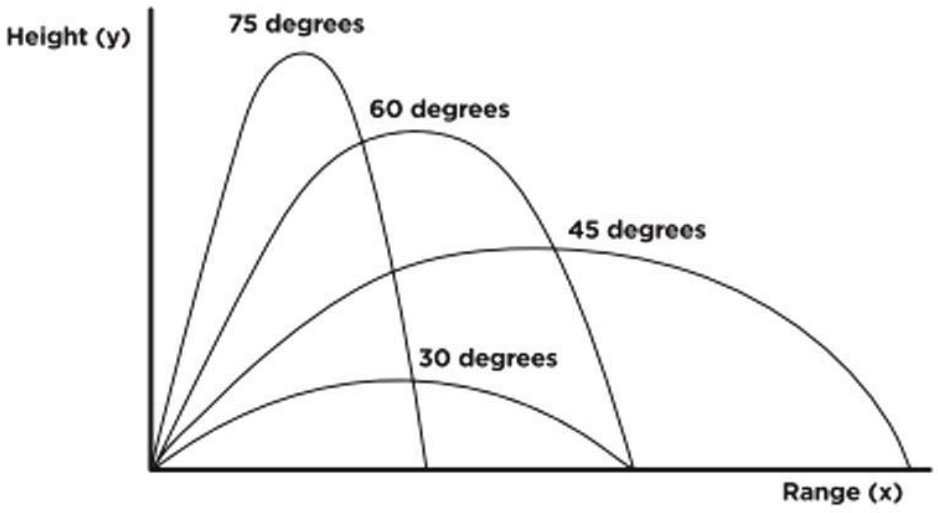

Let Velocity is V and the angle of projection with horizontal is θ.

$$\therefore \text{Range, } R = \frac{2V^2\sin\theta\cos\theta}{g} = \frac{V^2\sin2\theta}{g}$$

$$\Rightarrow \frac{dR}{d\theta} = \frac{V^2}{g}2\cos2\theta = 0 \Rightarrow 2\theta = 90^\circ \quad \Rightarrow \theta = 45^\circ$$

$$\Rightarrow \frac{d^2R}{d\theta^2} = -\frac{V^2}{g}4\sin2\theta, \text{ at } \theta = 45^\circ \Rightarrow \frac{d^2R}{d\theta^2} = -\frac{4V^2}{g} < 0$$

Hence, at $\theta = 45^\circ$, Range is maximum.

NDA 2 2022 - Physics Marathon

Q) The Coefficient of static friction between two surfaces depends upon

(a) nature of surface

(b) the shape of the surface in contact

(c) the magnitude of applied force

(d) none of these

SSBCrack EXAMS

Q) The Coefficient of static friction between two surfaces depends upon

(a) nature of surface

(b) the shape of the surface in contact

(c) the magnitude of applied force

(d) none of these

Friction force depends on normal force between bodies and co-efficient of friction between bodies. As we know normal force doesn't depend on shape of surface or area of contact, friction co-efficient is only parameter which only depends on nature of surface, so we can say co-efficient of friction force depends on Nature of surface.

NDA 2 2022 - Physics Marathon

Q) Which of the following statements about friction is true?

(a) kinetic friction is always greater than rolling friction

(b) frictional force is proportional to the area of contact between the two surfaces

(c) frictional force cannot accelerate a body

(d) friction can be reduced to zero

NDA 2 2022 - Physics Marathon

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(a) kinetic friction is always greater than rolling friction

(b) frictional force is proportional to the area of contact between the two surfaces

(c) frictional force cannot accelerate a body

(d) friction can be reduced to zero

As friction is an opposing force it resists the motion when two surfaces come in contact with each other. Its properties are:
i) It opposes the direction of motion.
ii) It is independent of the area of surfaces in contact
iii) It depends upon the type and nature of the material in contact (coefficient of friction)
iv) It depends upon the net normal force among the two surfaces
v) It does not initiate motion but respond
vi) It is parallel to those surfaces that are moving with respect to each other.
vii) Order for different types of friction:
static > kinetic > rolling
Frictional force can accelerate a body: Frictional force can cause acceleration but it would be in the opposite direction of the motion.
This statement is true.
Frictional force can be reduced to zero: Theoretically, frictional force can be zero for highly polished surfaces, ice, etc. But this isn't possible in real life.
Thus, this statement is partially true (since not completely wrong).

NDA 2 2022 - Physics Marathon

Q) On a banked road, which force is essential to provide the necessary centripetal force to a car to take a turn while driving at the optimum speed

(a) component of normal force

(b) component of frictional force

(c) Both

(d) none of these

SSBCrack EXAMS

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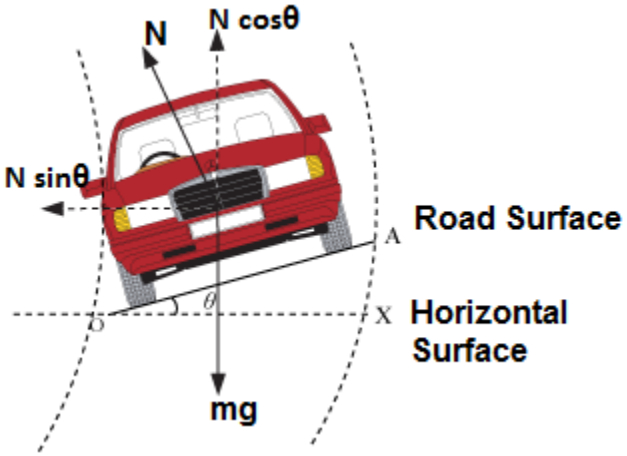

On a banked road, the horizontal component of the normal force and the frictional force contribute to provide centripetal force to keep the car moving on a circular turn without slipping.

SSBCrack EXAMS

Q) The formula for Kepler's third law is

(a) $T^3 \propto a^2$

(b) $T^3 \propto a^3$

(c) $T^2 \propto a^2$

(d) $T^2 \propto a^3$

SSBCrack EXAMS

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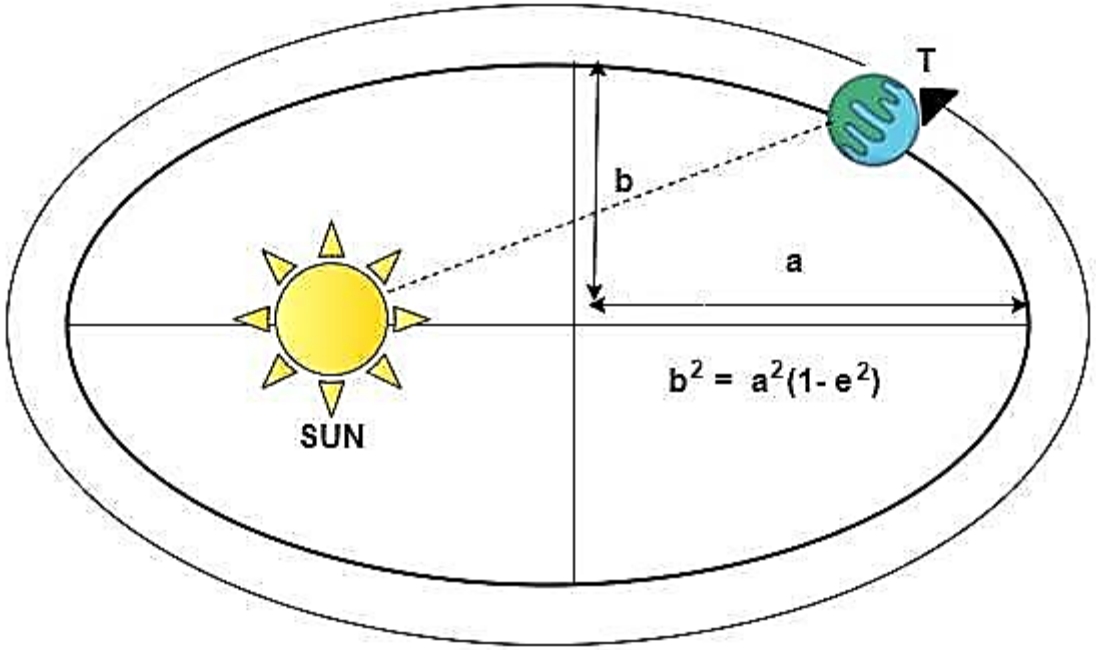

$T^2 \propto a^3$

T = Time to Complete Orbit

a = Length of Semi-major Axis

Kepler's Third Law of Planetary Motion

NDA 2 2022 - Physics Marathon

Q) If the radius of the earth were to be shrink by 1% its mass remaining the same, the acceleration due to gravity on the surface of the earth will

(a) increase by 1%

(b) decrease by 3%

(c) decrease by 1%

(d) increase by 2%

SSBCrack EXAMS

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(a) increase by 1%

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(c) decrease by 1%

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$$\frac{R^1 - R}{R} \times 100 = -1$$

$$R^1 = 0.99R$$

$$g^1 = \frac{G(M)}{(99R)^2} = \frac{g}{(0.99)^2}$$

$$\text{Percentage change in g} = \frac{g^1 - g}{g} \times 100$$

$$= \left(\frac{1}{(0.99)^2 - 1}\right) \times 100 = 2\%$$

NDA 2 2022 - Physics Marathon

Q) According to which law, the line connecting any planet to the sun covers equal areas at equal time intervals?

(a) Gravitational law

(b) The Periodic Law

(c) The Law of areas

(d) The orbital law

SSBCrack EXAMS

Q) According to which law, the line connecting any planet to the sun covers equal areas at equal time intervals?

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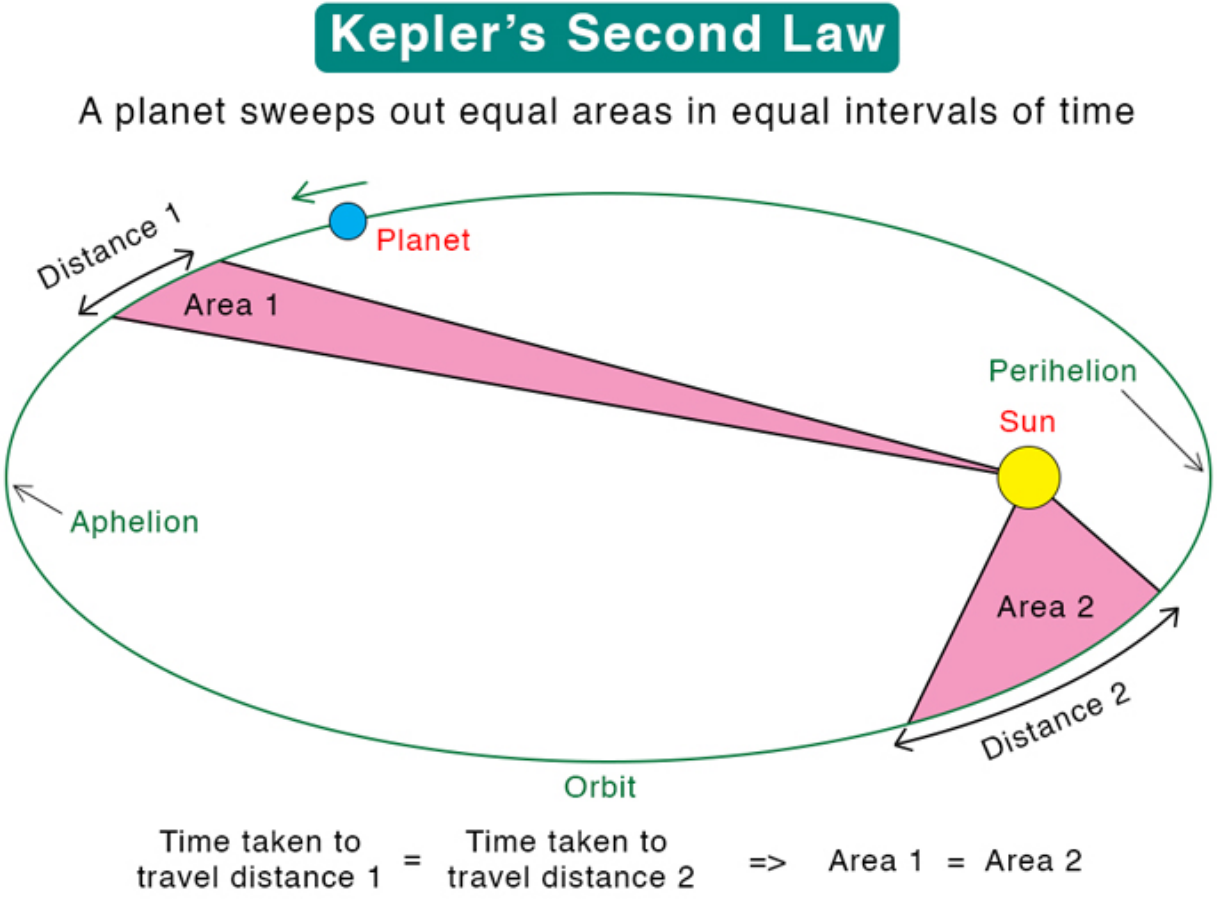

NDA 2 2022 - Physics Marathon

Q) The sun is positioned ____ of the planet's orbit, according to Kepler's law of orbit.

(a) in the center

(b) in one of the foci

(c) in both foci

(d) along the semi-minor axis

SSBCrack EXAMS

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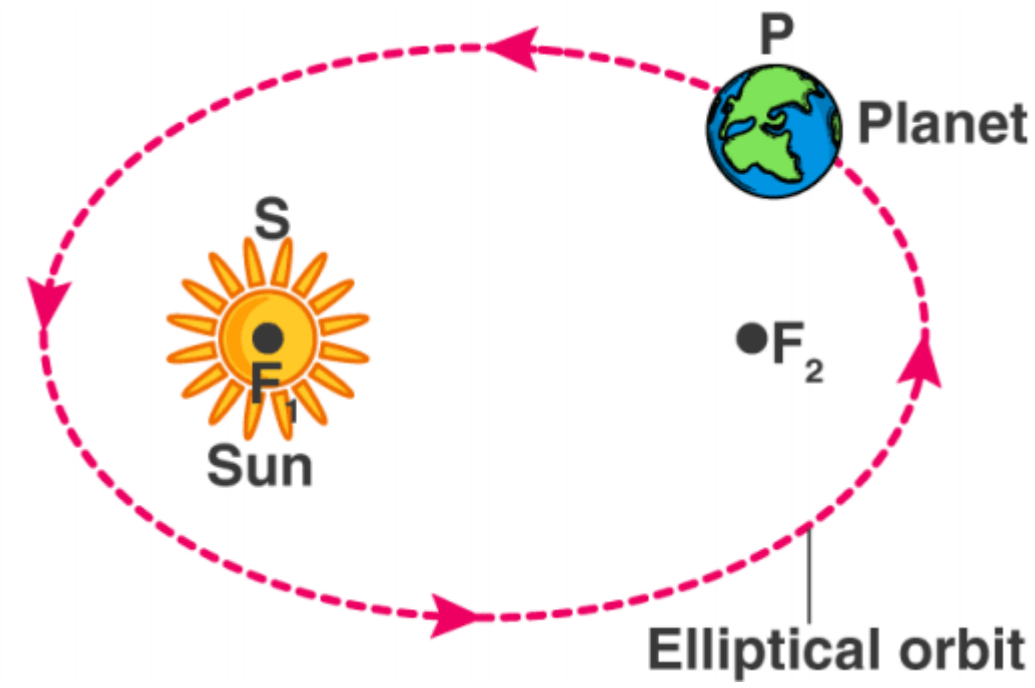
(a) in the center

(b) in one of the foci

(c) in both foci

(d) along the semi-minor axis

Kepler's First Law: Each planet's orbit about the Sun is an ellipse. The Sun's center is always located at one focus of the orbital ellipse. The Sun is at one focus. The planet follows the ellipse in its orbit, meaning that the planet to Sun distance is constantly changing as the planet goes around its orbit.



NDA 2 2022 - Physics Marathon

Q) Four wires whose lengths and diameter respectively are given below are made of the same material. Which of these will have the largest extension when same tension is applied?

(a) 0.50 m, 0.50 mm

(b) 1.00 mm, 1.00 mm

(c) 2.00 m, 2.00 mm

(d) 4.00 m, 4.00 mm

NDA 2 2022 - Physics Marathon

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(c) 2.00 m, 2.00 mm

(d) 4.00 m, 4.00 mm

Using Hook'e law $Y = \frac{FL}{A\Delta L}$ where $A = \frac{\pi D^2}{4}$

$\Rightarrow \Delta L = K\frac{L}{D^2}$ where K = constant

For wire A : $\frac{L}{D^2} = \frac{50}{(0.05)^2} = 20000$

For wire B : $\frac{L}{D^2} = \frac{100}{(0.1)^2} = 10000$

For wire C : $\frac{L}{D^2} = \frac{200}{(0.2)^2} = 5000$

For wire D : $\frac{L}{D^2} = \frac{300}{(0.3)^2} = 3333.33$

Thus wire A has the largest extension.

SSBCrack EXAMS

Q) Which of the following is ***not*** a thermodynamical function

(a) Enthalpy

(b) Work done

(c) Gibb's energy

(d) Internal energy

SSBCrack EXAMS

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(a) Enthalpy

(b) Work done

(c) Gibb's energy

(d) Internal energy

U Internal energy	F Helmholtz free energy
H Enthalpy	G Gibbs free energy

NDA 2 2022 - Physics Marathon

Q) When the intermolecular distance increases due to tensile force, then

(a) There is no force between the molecules

(b) There is a repulsive force between the molecules

(c) There is an attractive force between the molecules

(d) There is zero resultant force between the molecules

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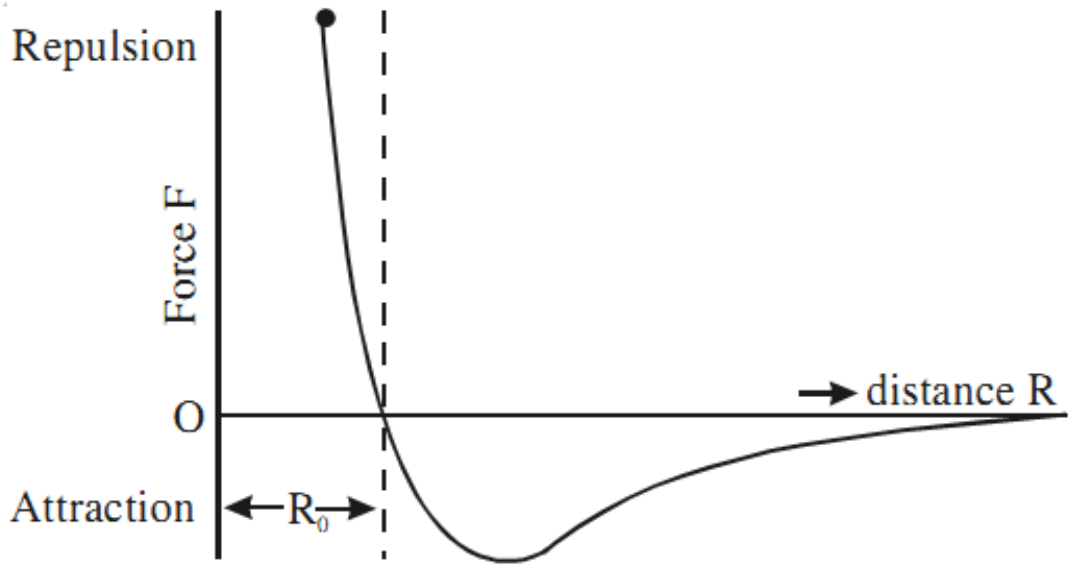

NDA 2 2022 - Physics Marathon

Q) The magnitude of the force developed by raising the temperature from 0°C to 100°C of the iron bar of 1.00 m long and 1 cm^2 cross-section when it is held so that it is not permitted to expand, or bend is (Temperature Co-efficient = $10^{-5}/^oC$ and Y = 10^{11} N/m^2)

(a) 10^3 N

(b) 10^4 N

(c) 10^5 N

(d) 10^9 N

NDA 2 2022 - Physics Marathon

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(a) 10^3 N

(b) 10^4 N

(c) 10^5 N

(d) 10^9 N

The expression for force is F= Y x A x α x ΔT
where Y is the Young's modulus, A the area of cross section, α the coefficient of linear expansion and ΔT is temperature difference. It is independent of length.

$F = (10^{11}\ N/m^2) \times 1 \times 10^{-4}\ m^2 \times (10^{-5}\ /°C) \times 100\ °C$

$= 10^4$ N

Q) The molar specific heat constant pressure of an ideal gas is 7R/2. The ratio of specific heat at constant pressure to that at constant volume is?

a) 9/7

b) 8/7

c) 7/5

d) 5/7

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(a) 9/7

(b) 8/7

(c) 7/5

(d) 5/7

We have given molar specific heat at constant pressure

$$C_P = \frac{7}{2}R$$

We know $C_p - C_v = R$

$$\Rightarrow C_V = C_p - R = \frac{7}{2}R - R = \frac{5}{2}R$$

Hence, required ratio is

$$\gamma = \frac{C_p}{C_V} = \frac{(7/2)R}{(5/2)R} = \frac{7}{5}.$$

NDA 2 2022 - Physics Marathon

Q) The maximum number of rectangular components into which a vector can be split in its own plane is

(a) 1

(b) 2

(c) 3

(d) 4

SSBCrack EXAMS

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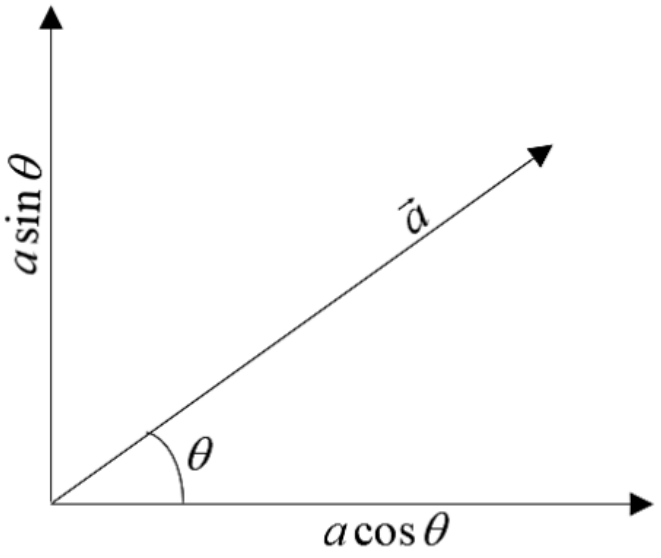

A vector can be split maximum into 2 rectangular components in its own plane, which are Vcosθ and Vsinθ. If it is divided into more, they are not independent and can be represented in terms of other components.

NDA 2 2022 - Physics Marathon

Q) Which of the following is in the decreasing order of penetrating power?

(a) α, β, γ

(b) β, α, γ

(c) γ, α, β

(d) γ, β, α

SSBCrack EXAMS

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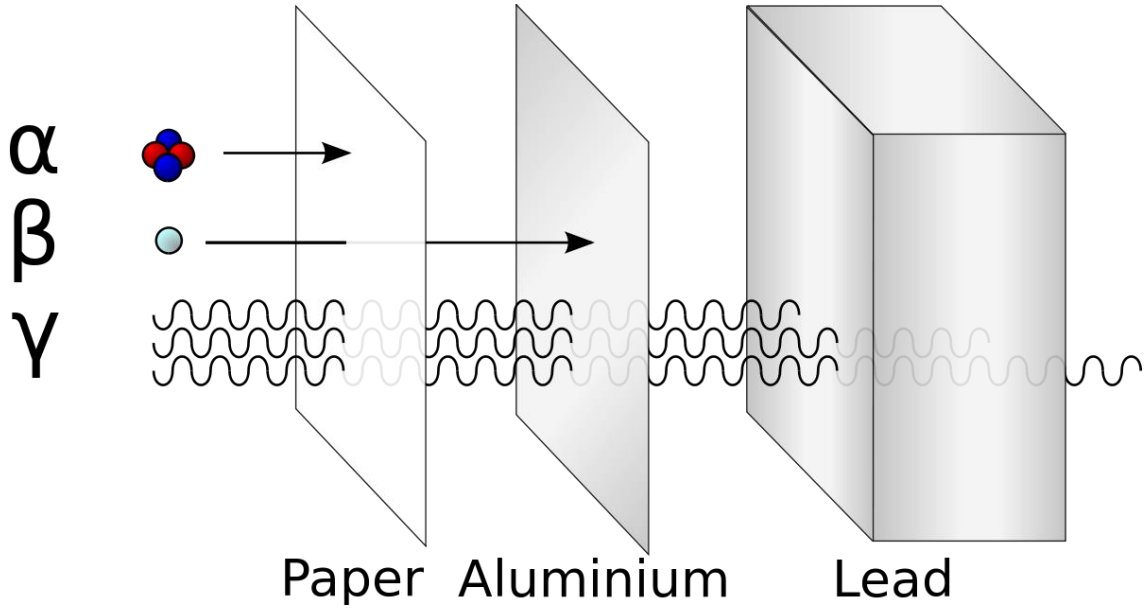

NDA 2 2022 - Physics Marathon

Q) If $\vec{A} \cdot \vec{B}$ = AB, then the angle between $\vec{A}$ and $\vec{B}$ is

(a) 90^0

(b) 0^0

(c) 45^0

(d) 30^0

SSBCrack EXAMS

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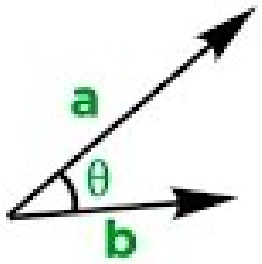

$$\mathbf{a} \cdot \mathbf{b} = |\mathbf{a}||\mathbf{b}| \cos\theta$$

If $\vec{A} \cdot \vec{B}$ = AB then cosθ = 1 and hence θ = 0^0

NDA 2 2022 - Physics Marathon

Q) If $\vec{A} \times \vec{B}$ = AB, then the angle between $\vec{A}$ and $\vec{B}$ is

(a) 90^0

(b) 0^0

(c) 45^0

(d) 30^0

SSBCrack EXAMS

Q) If $\vec{A}$ X $\vec{B}$ = AB, then the angle between $\vec{A}$ and $\vec{B}$ is

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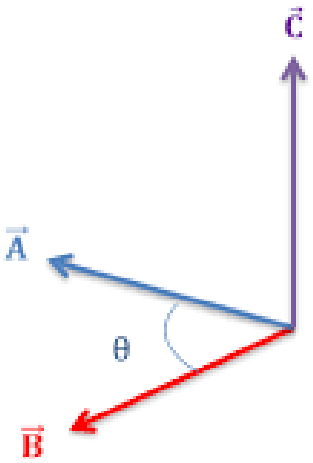

$$\vec{C} = \vec{A} \times \vec{B}$$

$$|C| = |A||B|\sin(\theta)$$

If $\vec{A}$ X $\vec{B}$ = AB then sinθ = 1 and hence θ = 90^0

NDA 2 2022 - Physics Marathon

Q) When a ball is projected upwards, then its acceleration at the highest point is equal to ……. and is directed …….

(a) 0, downward.

(b) acceleration due to gravity, downward

(c) acceleration due to gravity, upward.

(d) None of the above

NDA 2 2022 - Physics Marathon

Q) When a ball is projected upwards, then its acceleration at the highest point is equal to ……. and is directed …….

(a) 0, downward.

(b) acceleration due to gravity, downward

(c) acceleration due to gravity, upward.

(d) None of the above

Acceleration of the ball during any stage is constant in g and direction ,it is $g = 9.8 m/s^2$ and its downwards.

NDA 2 2022 - Physics Marathon

Q) If the body is moving in a circle of radius r with a constant speed v, its angular velocity is

(a) v^2/r

(b) vr

(c) v/r

(d) r/v

SSBCrack EXAMS

Q) If the body is moving in a circle of radius r with a constant speed v, its angular velocity is

(a) v^2/r

(b) vr

(c) v/r

(d) r/v

$$v = r\omega \Rightarrow \omega = \frac{v}{r} = \text{constant}$$ [As v and r are constant]

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NDA 2 2022 - Physics Marathon

Q) A student has measured the length of a wire equal to 0.04580 m. This value of length has the number of significant figures equal to

(a) Five

(b) four

(c) Six

(d) None of these

SSBCrack EXAMS

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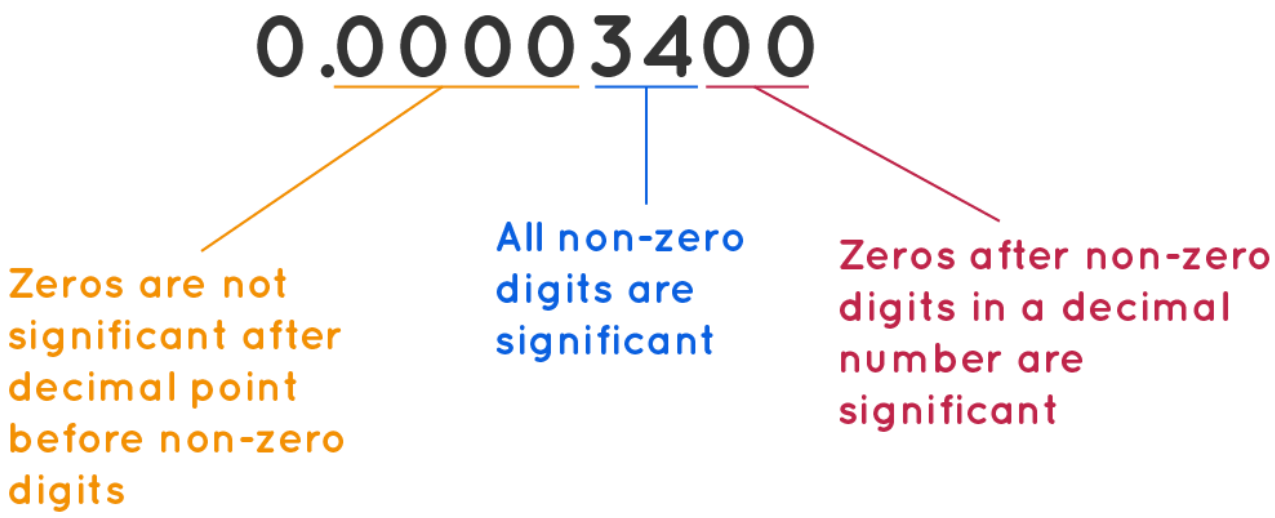

The given value of length has four significant figures – 4, 5, 8 and 0 because the zeroes left to a non-zero number are not counted but all other zeroes are counted if a number contains a decimal point.

NDA 2 2022 - Physics Marathon

Q) The magnetic field at a distance r from a long wire carrying current i is 0.4 tesla. The magnetic field at a distance 2r is

(a) 0.2 tesla

(b) 0.8 tesla

(c) 0.1 tesla

(d) 1.6 tesla

SSBCrack EXAMS

Q) The magnetic field at a distance r from a long wire carrying current i is 0.4 tesla. The magnetic field at a distance 2r is

(a) 0.2 tesla

(b) 0.8 tesla

(c) 0.1 tesla

(d) 1.6 tesla

From Ampere's Law

$$\oint \vec{B}.\vec{d\ell} = \mu_0 (I_{net})$$

or $$B(2\pi r) = \mu_0 I$$

and $$B = \frac{\mu_0}{2\pi}\frac{I}{r} \quad (\text{for } r \geq R) \quad .....(a)$$

$$B = \frac{\mu_0 i}{2\pi r} \text{ or } B \propto \frac{1}{r}$$

When r is doubled, the magnetic field becomes half, i.e., now the magnetic field will be 0.2 T.

NDA 2 2022 - Physics Marathon

Q) Two equations of two S.H.M. are $x = a\sin(\omega t - \alpha)$ and $y = b\cos(\omega t - \alpha)$. The phase difference between the two is

(a) 0°

(b) 360°

(c) 90°

(d) 180°

SSBCrack EXAMS

Q) Two equations of two S.H.M. are $x = a\sin(\omega t - \alpha)$ and $y = b\cos(\omega t - \alpha)$. The phase difference between the two is

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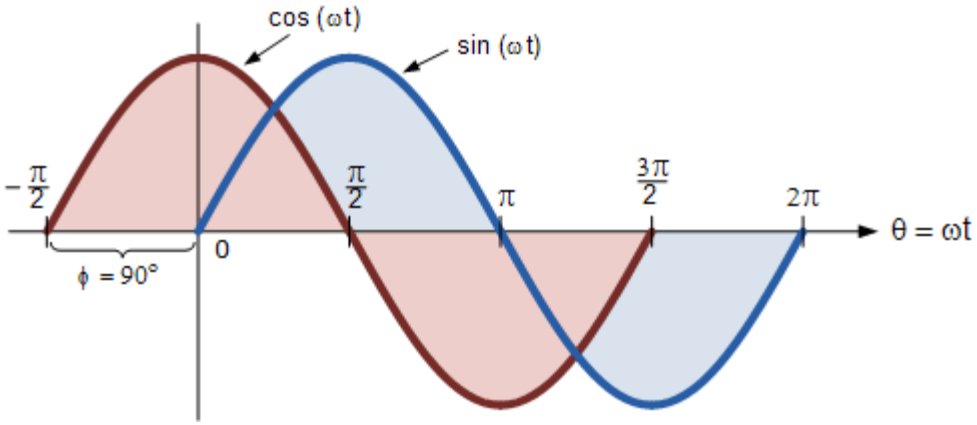

$$y = a\sin(\omega t - \alpha) = a\cos\left(\omega t - \alpha - \frac{\pi}{2}\right)$$

Another equation is given $y = \cos(\omega t - \alpha)$

So, there exists a phase difference of

$$\frac{\pi}{2} = 90^\circ$$

NDA 2 2022 - Physics Marathon

Q) A 220 V, 100watt bulb is joined with a 110 V supply. The power consumed by the bulb is

(a) 50 watt

(b) 25 watt

(c) 80 watt

(d) 100 watt

SSBCrack EXAMS

Q) A 220 V, 100watt bulb is joined with a 110 V supply. The power consumed by the bulb is

(a) 50 watt

(b) 25 watt

(c) 80 watt

(d) 100 watt

The resistance of bulb,

$$R = \frac{V^2}{P} = \frac{(220)^2}{100} = 484\ \Omega$$

The current in bulb when on 110 V line

$$= \frac{V}{R} = \frac{110}{484}\ A$$

Power consumed by bulb in 110 V line

$$= VI = \frac{110}{484} \times 110 = 25W.$$

SSBCrack EXAMS

Q) The dimensional formula for angular momentum is

(a) $[M^0L^2T^{-2}]$

(b) $[ML^2T^{-1}]$

(c) $[MLT^{-1}]$

(d) $[ML^2T^{-2}]$

SSBCrack EXAMS

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(a) $[M^0L^2T^{-2}]$

(b) $[ML^2T^{-1}]$

(c) $[MLT^{-1}]$

(d) $[ML^2T^{-2}]$

$$[\text{Angular momentum}]$$
$$= [\text{moment of inertia}] \times [\text{angular velocity}]$$
$$= ML^2 \times T^{-1} = ML^2T^{-1}$$

NDA 2 2022 - Physics Marathon

Q) One end of a steel wire of area of cross-section 3 mm^2 is attached to the ceiling of an elevator moving up with an acceleration of 2.2 m/s^2. if a load of 8 kg is attached at its free end, then the stress developed in the wire will be

(a) 8×10^6 N/m^2

(b) 16×10^6 N/m^2

(c) 20×10^6 N/m^2

(d) 32×10^6 N/m^2

NDA 2 2022 - Physics Marathon

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(c) 20×10^6 N/m^2

(d) 32×10^6 N/m^2

Area of wire(A)=3mm^2 = 3 x 10^{-6}m
Acceleration(a)=2.2ms^{-2}
Mass(m)=8kg
Due to the acceleration, tension is developed in the string.
We know that,
Tension = mg – ma =8 x (10-2.2)
Tension=62.4N
The stress developed can be calculated using the formula,
Stress = force/Area
=62.4/(3 x 10^{-6})
=20.8 x 10^6 N/m^2

NDA 2 2022 - Physics Marathon

Q) The value of g at a particular point is 9.8 m/sec² suppose the earth suddenly shrink uniformly to half its present size without losing any mass. The value of g at the same point (assuming that the distance of the point from the centre of the earth does not shrink) will become

(a) 9.8 m/sec²

(b) 4.9 m/sec²

(c) 19.6 m/sec²

(d) 2.45 m/sec²

NDA 2 2022 - Physics Marathon

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(b) 4.9 m/sec²

(c) 19.6 m/sec²

(d) 2.45 m/sec²

Acceleration of gravitation, $a=GM/r^2$
where,
M is mass of earth and r is separation between both masses.
If volume is reduced, keeping mass and separation between them same then.
From the formula it is clear that acceleration of gravity will remain constant.
Hence, value of g will be $9.8ms^{-2}$

NDA 2 2022 - Physics Marathon

Q) If two masses (M &m) are connected on a horizontal plane and a force is applied on the combination, then the tension T depends on

(a) whether force is applied on M or m

(b) the force applied on the system

(c) can't be predicted

(d) none of these

SSBCrack EXAMS

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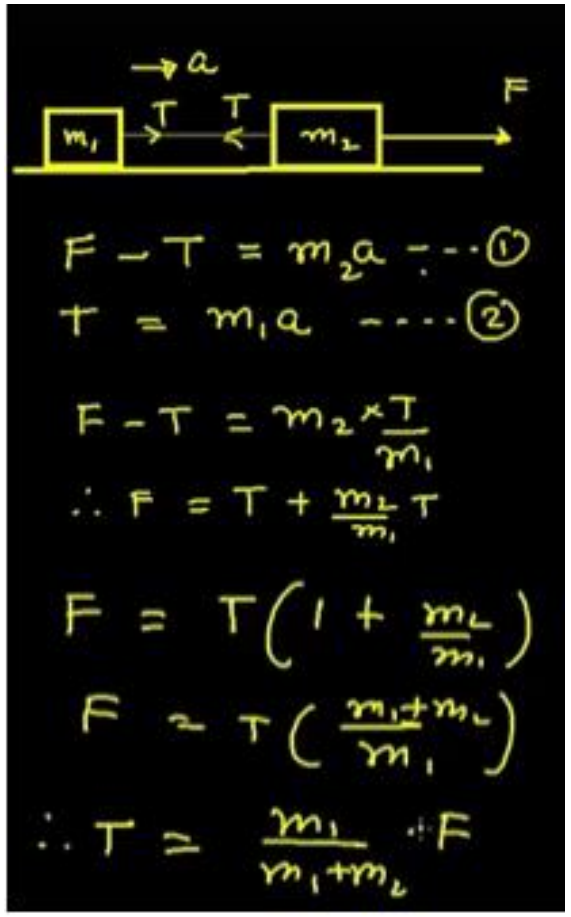

NDA 2 2022 - Physics Marathon

Q) A body of mass m moving with velocity 3 km/h collides with a body of mass 2m at rest. Now the coalesced mass starts to move with a velocity

(a) 1 km/h

(b) 2 km/h

(c) 3 km/h

(d) 4 km/h

SSBCrack EXAMS

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(a) 1 km/h

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(c) 3 km/h

(d) 4 km/h

Applying law of conservation of momentum,

$$m_1u_1 + m_2u_2 = (m_1 + m_2)v$$

$$\text{or, } m_1u_1 = (m_1 + m_2)v \qquad (\because u_2 = 0)$$

$$\Rightarrow m \times \frac{(3 \times 1000)}{3600} = 3m(v)$$

$$\Rightarrow v = \frac{1000}{3600} \text{ m/s} = 1 \text{ km/hr}$$

NDA 2 2022 - Physics Marathon

Q) A body starts from rest from the origin with an acceleration of 6 m/s^2 along the x-axis and 8 m/s^2 along the y-axis. Its distance from the origin after 4 seconds will be

(a) 56 m

(b) 64 m

(c) 80 m

(d) 128 m

SSBCrack EXAMS

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(a) 56 m

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(c) 80 m

(d) 128 m

a_x=6m/s^2 & a_y=8m/s^2

and, $\vec{a} = a_x\hat{\imath} + a_y\hat{\jmath}$

Or $\vec{a} = 6\hat{\imath} + 8\hat{\jmath}$

So, $|\vec{a}| = \sqrt{6^2 + 8^2}$

$|\vec{a}|$=10m/s2

t=4sec

u=0m/s

From 2nd equation of motion

$$S = ut + \frac{1}{2}at^2$$

$$S = 0 \times 4 + \frac{1}{2} \times 10 \times 4 \times 4$$

S=80m

NDA 2 2022 - Physics Marathon

Q) The potential energy of a satellite, having mass m and rotating at a height of 6.4×10^6 m from the earth surface, is

(a) $-mgR_e$

(b) $-0.67\ mgR_e$

(c) $-0.5\ mgR_e$

(d) $-0.33\ mgR_e$

SSBCrack EXAMS

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(d) $-0.33\ mgR_e$

$$G = 6.7x10^{-11}\frac{Nm^2}{kg^2}$$

$$\boxed{U_g = \frac{-GMm}{r}}$$

M = mass of object 1
m = mass of object 2
r = center to center distance between M and m

Mass of the satellite = m and height of satellite from earth (h) = 6.4×10^6 m.

We know that gravitational potential energy of the satellite at height

$$h = -\frac{GM_e m}{R_e + h} = -\frac{gR_e^2 m}{2R_e}$$

$$= -\frac{gR_e m}{2} = -0.5\,mgR_e$$

(where, $GM_e = gR_e^2$ and $h = R_e$)

NDA 2 2022 - Physics Marathon

Q) A body of mass 2 kg is moving with a velocity 8m/s on a smooth surface. If it is to be brought to rest in 4 seconds, then the force to be applied is

(a) 8 N

(b) 4 N

(c) 2 N

(d) 1 N

NDA 2 2022 - Physics Marathon

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(a) 8 N

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(d) 1 N

$$F = ma = \frac{m(u-v)}{t} = \frac{2 \times (8-0)}{4} = 4\,N$$

NDA 2 2022 - Physics Marathon

Q) To break a wire, a force of 10^6 N/m^2 is required. If the density of the material is 3×10^3 kg/m^3, then the length of the wire which will break by its own weight will be

(a) 34 m

(b) 30 m

(c) 300 m

(d) 3 m

SSBCrack EXAMS

Q) To break a wire, a force of 10^6 N/m^2 is required. If the density of the material is 3×10^3 kg/m^3, then the length of the wire which will break by its own weight will be

(a) 34 m

(b) 30 m

(c) 300 m

(d) 3 m

$$L = \frac{S}{dg} = \frac{10^6}{3 \times 10^3 \times 10} = \frac{100}{3} = 34\,m$$

NDA 2 2022 - Physics Marathon

Q) At what temperature the molecule of nitrogen will have same rms velocities as the molecule of oxygen at 127°C ?

(a) 457°C

(b) 273°C

(c) 350°C

(d) 77°C

SSBCrack EXAMS

Q) At what temperature the molecule of nitrogen will have same rms velocities as the molecule of oxygen at 127°C ?

(a) 457°C

(b) 273°C

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(d) 77°C

$$V_{rms} \propto \sqrt{\frac{T}{M}}$$

Molecular weight of $O_2 = 32$

Molecular weight of $N_2 = 28$

For equal rms velocity,

$$\left(\frac{T}{M}\right)_{O_2} = \left(\frac{T}{M}\right)_{N_2}$$

$$T_{O_2} = 127°C = 400K$$

$$\therefore \quad T_{N_2} = 400 \times \frac{28}{32} = 350K = 77°C$$

NDA 2 2022 - Physics Marathon

Q) Two coils of self inductances 4 mH and 4 mH are placed so close together that the effective flux in one coil is completely linked with the other. The mutual inductance between these coils is

(a) 6 mH

(b) 4 mH

(c) 16 mH

(d) 10 mH

SSBCrack EXAMS

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(a) 6 mH

(b) 4 mH

(c) 16 mH

(d) 10 mH

Mutual Inductance of two coils

$$M = \sqrt{M_1 M_2} = \sqrt{4\text{mH} \times 4\text{mH}} = 4\text{mH}$$

NDA 2 2022 - Physics Marathon

Q) Which of the following electromagnetic waves has maximum wavelength?

(a) Microwaves

(b) Audible waves

(c) Ultrasonic wave

(d) Radiowaves

SSBCrack EXAMS

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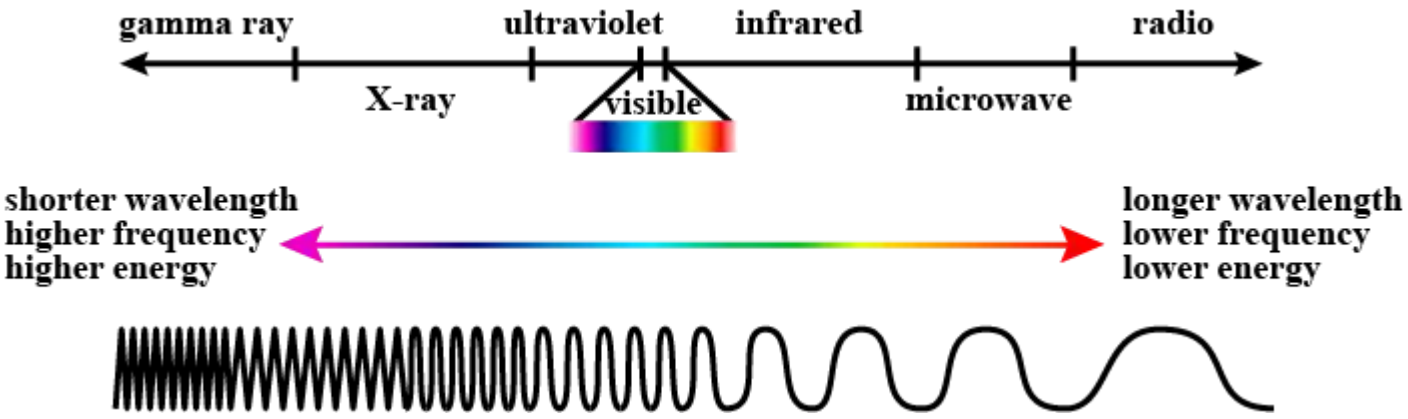

Audible waves and ultrasonic wave are not electromagnetic waves.

NDA 2 2022 - Physics Marathon

Q) An X-rays tube is being operated at 20 kV, the maximum speed of electrons striking the anticathode will be

(a) 8.4 m/s

(b) 8.4×10^7 m/s

(c) 4.4×10^7 m/s

(d) zero

SSBCrack EXAMS

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(c) 4.4×10^7 m/s

(d) zero

$$v_{max} = \sqrt{\frac{2eV}{m}}$$

$$= \sqrt{\frac{2 \times 1.6 \times 10^{-19} \times 20 \times 10^3}{9.1 \times 10^{-31}}}$$

$$v_{max} = 8.4 \times 10^7 \text{ m/s}$$

NDA 2 2022 - Physics Marathon

Q) At a certain place, the horizontal component of earth's magnetic field is $\sqrt{3}$ times the vertical component. The angle of dip at that place is

(a) 60°

(b) 45°

(c) 90°

(d) 30°

SSBCrack EXAMS

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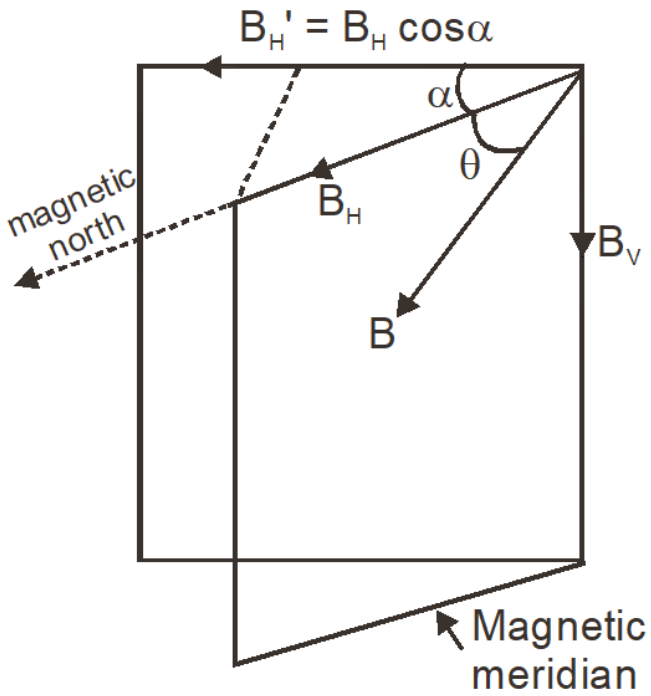

$B_H = \sqrt{3}\, B_V$, also

$$\tan\phi = \frac{B_V}{B_H} = \frac{1}{\sqrt{3}} \Rightarrow \phi = 30^\circ$$

NDA 2 2022 - Physics Marathon

Q) A boat carrying steel balls is floating the surface of water in a tank . If the balls are thrown into the tank one by one, how will it affect the level of water

(a) it will remain unchanged

(b) it will rise

(c) it will fall

(d) first it will first rise and then fall

SSBCrack EXAMS

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(a) it will remain unchanged

(b) it will rise

(c) it will fall

(d) first it will first rise and then fall

When steel balls in boat, volume of water displaced

$$V_1 = \frac{M + m}{\rho_\omega}$$

When steel balls sink, $V_2 = \frac{M}{\rho_\omega} + \frac{M}{\sigma_s}$

$\sigma_s > \rho_\omega$, $V_2 < V_1$, level will fall.

NDA 2 2022 - Physics Marathon

Q) The moment of inertia of uniform rectangular plate about an axis passing through its mid-point and parallel to its length *l* is (b = breadth of rectangular plate)

(a) $\frac{Mb^2}{4}$

(b) $\frac{Mb^3}{6}$

(c) $\frac{Mb^3}{12}$

(d) $\frac{Mb^2}{12}$

SSBCrack EXAMS

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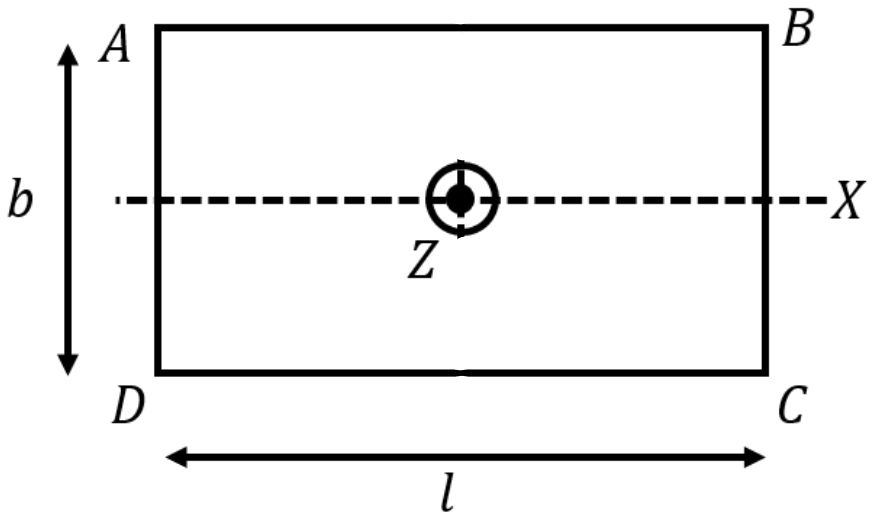

M.I. of plate about O and parallel to length

$$= \frac{Mb^2}{12}$$

NDA 2 2022 - Physics Marathon

Q) Focal length of a concave mirror is 6 cm. If the object is at distance 4cm from the focus, then the position of the image w.r.t. the focus is

(a) 9 cm

(b) 4 cm

(c) 8 cm

(d) 6 cm

SSBCrack EXAMS

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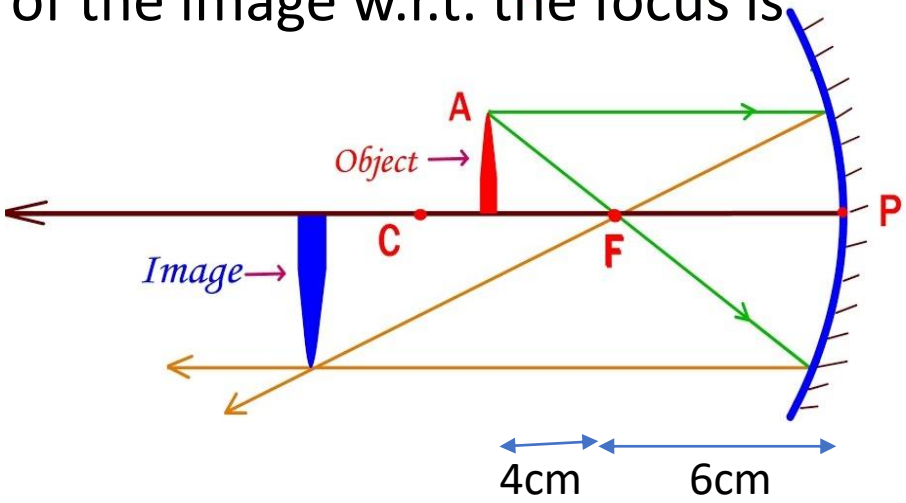

If x_1 and x_2 are distances of the object and image from focus then focal length,

$$f = \sqrt{x_1 x_2} \Rightarrow x_2 = \frac{f^2}{x_1} = \frac{36}{4} = 9 \text{ cm.}$$

NDA 2 2022 - Physics Marathon

Q) If in nature there may not be an element for which the principal quantum number $n > 4$, then the total possible number of elements will be

(a) 60

(b) 32

(c) 4

(d) 64

SSBCrack EXAMS

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(a) 60

(b) 32

(c) 4

(d) 64

For $n = 1$, maximum number of states $= 2n^2$ $= 2$ and for $n = 2, 3, 4$, maximum number of states would be 8, 18, 32 respectively,

Hence number of possible elements

$= 2 + 8 + 18 + 32 = 60.$

NDA 2 2022 - Physics Marathon

Q) A source of sound of frequency 500 Hz is moving towards a stationary observer with velocity 30m/s. The speed of sound is 330 m/s. The frequency heard by the observer will be

(a) 545 Hz

(b) 580 Hz

(c) 458.3 Hz

(d) 550 Hz

SSBCrack EXAMS

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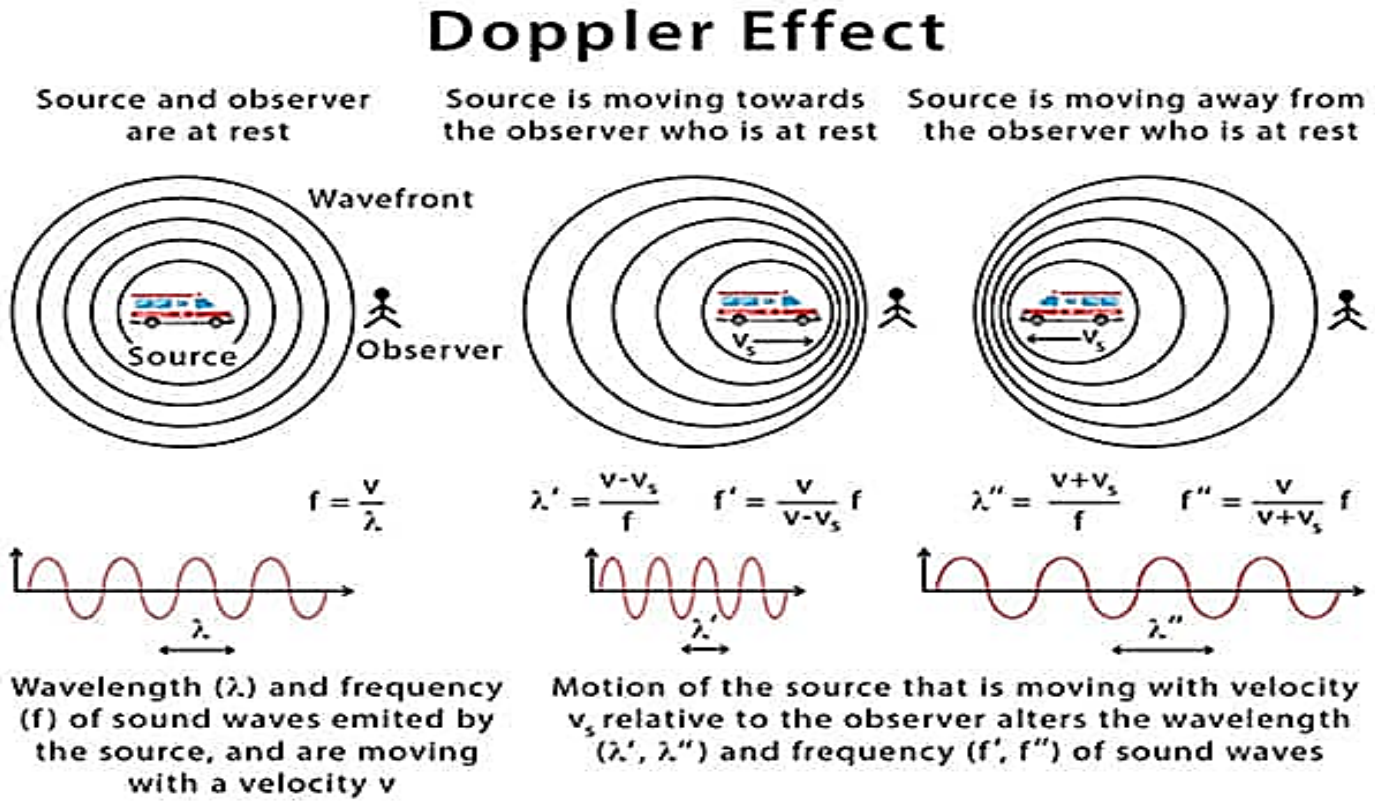

$$\nu' = \left(\frac{v}{v - v_s}\right)\nu = \frac{330}{330-30} \times 500$$

$$= 110 \times 5 = 550\,\text{Hz}$$

NDA 2 2022 - Physics Marathon

Q) In a series resonant circuit, having L, C and R as its elements, the resonant current is *i*. The power dissipated in the circuit at resonance is

(a) $\frac{i^2 R}{\left(\omega L - \frac{1}{\omega C}\right)}$

(b) Zero

(c) $i^2 \omega L$

(d) $i^2 R$

SSBCrack EXAMS

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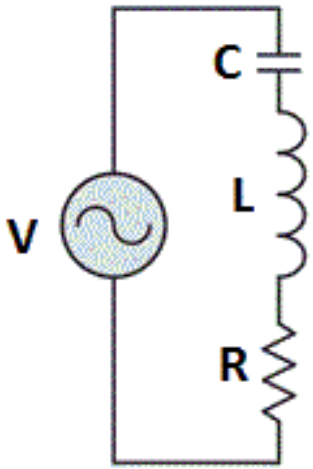
(d) i^2R

Series Resonant Circuit



At resonance

* $X_L = X_C$
* $f_r = \frac{1}{2\pi\sqrt{LC}}$
* $Z_S = R$ (min.)
* $I = \frac{V}{R}$ (max.)

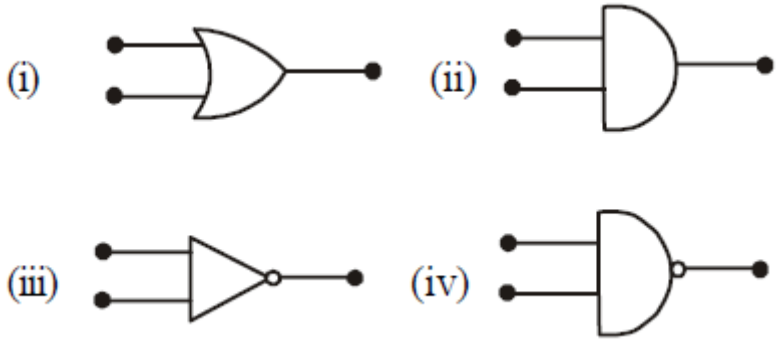
At resonance $L\omega = \frac{1}{C\omega}$, $\omega = \frac{1}{\sqrt{LC}}$

Current through circuit $i = \frac{E}{R}$

Power dissipated at Resonance $= i^2R$

SSBCrack EXAMS

Q) Symbolic representation of four logic gate are shown as
Pick out which ones are for AND, NAND and NOT gates, respectively



(a) (ii), (iii) and (iv)

(b) (iii), (ii) and (i)

(c) (iii), (iii) and (iv)

(d) (ii), (iv) and (iii)

SSBCrack EXAMS

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Pick out which ones are for AND, NAND and NOT gates, respectively

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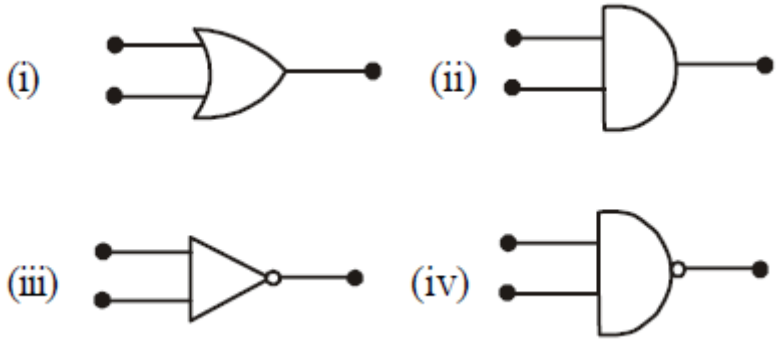
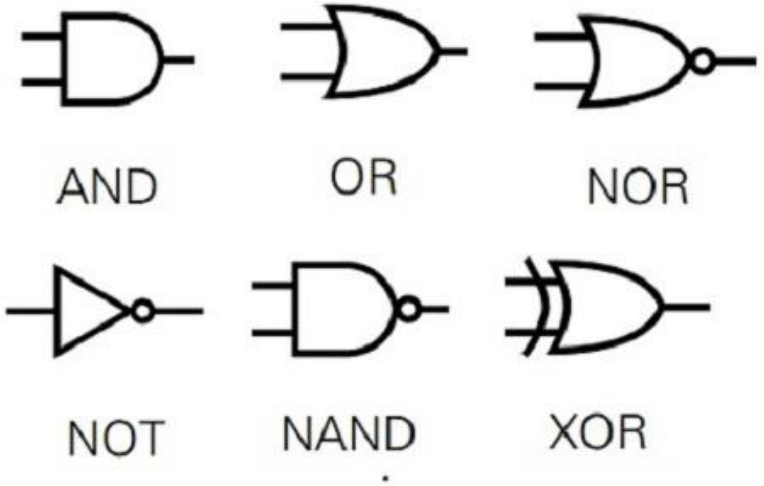
(c) (iii), (iii) and (iv)

(d) (ii), (iv) and (iii)





NDA 2 2022 - Physics Marathon

Q) In Young's double slit experiment, the wavelength of the light used is doubled and distance between two slits remains unchanged, then the resultant fringe width becomes

(a) 2 times

(b) 3 times

(c) 4 times

(d) 1/2 times

SSBCrack EXAMS

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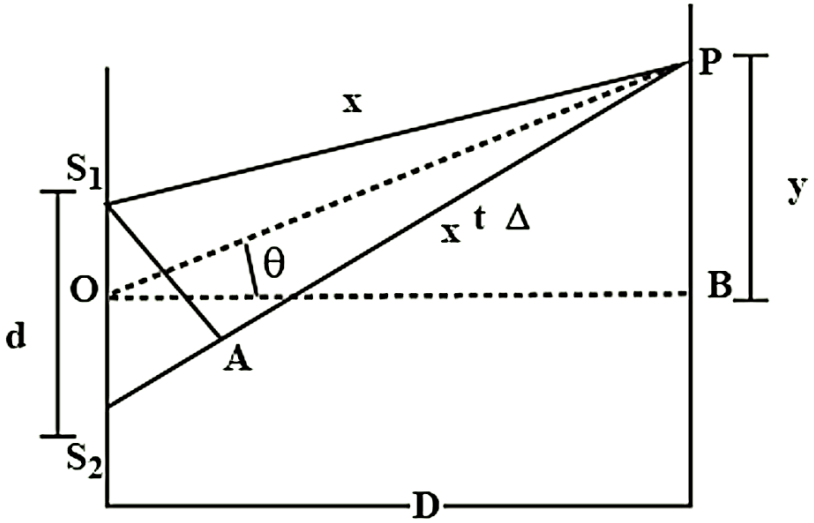

From path difference

$$\Delta x = PS_2 - PS_1 \approx PS_2 - PA$$

$$= S_2A = dsin\theta$$

$$\approx dtan\theta = \frac{dy}{D}$$

fringe width $\beta = \frac{D\lambda}{d}$

NDA 2 2022 - Physics Marathon

Q) If the mass of earth is 80 times of that of a planet and diameter is double that of planet and 'g' on earth is 9.8 m/s^2, then the value of 'g' on that planet is

(a) 4.9 m/s^2

(b) 0.98 m/s^2

(c) 0.49 m/s^2

(d) 49 m/s^2

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$M_e = 80M_p$

$R_e = 2R_p$

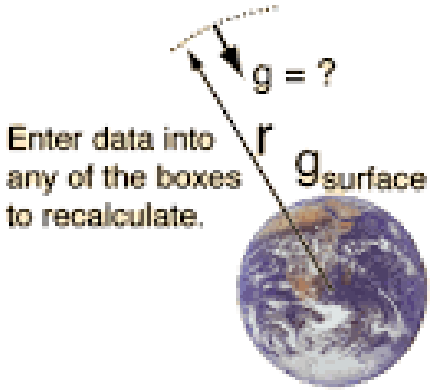
$g = GM/R^2$

So, $\frac{g_p}{g_e} = \frac{M_P}{R_P^2} \cdot \frac{R_e^2}{M_e}$

$g_p = 9.8x \frac{M_P}{R_P^2} \cdot \frac{(2R_p^2)}{80M_p}$

$g_p = 9.8x4/80$

$g_p = 0.49 m/s^2$



$$F_{gravity} = m\frac{GM_{Earth}}{R_{Earth}^2} = mg$$

$$M_E = 5.98x10^{24} kg$$

$$R_E = 6.38x10^6 m \quad (Average)$$

$$G = 6.67259x10^{-11} Nm^2 / kg^2$$

SSBCrack EXAMS

Q) The maximum range of a gun of horizontal terrain is 16 km. If g = 10 ms^{-2}, then muzzle velocity of a shell must be

(a) 160 ms^{-1}

(b) $200\sqrt{2}$ ms^{-1}

(c) 400 ms^{-1}

(d) 800 ms^{-1}

SSBCrack EXAMS

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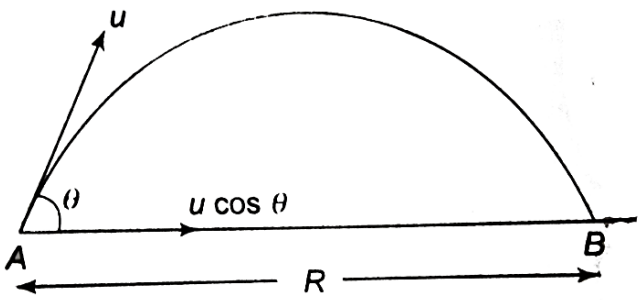

$$R = u_x \times T = u\cos\theta \times \frac{2u\sin\theta}{g}$$

$$R = \frac{u^2 \sin 2\theta}{g}$$

For maximum range $\theta = 45^\circ$, $\sin 2\theta = 1$

$$\therefore R_{max} = \frac{u^2}{g}$$

Given $R = 16km = 16 \times 10^3 m$

$g = 10m/s^2$

$\Rightarrow u^2 = 16 \times 10^2 \times 10$

$\Rightarrow u = 400m/s.$

NDA 2 2022 - Physics Marathon

Q) If the length of a simple pendulum is increased by 2%, then the time period

(a) increases by 2%

(b) decreases by 2%

(c) increases by 1%

(d) decreases by 1 %

SSBCrack EXAMS

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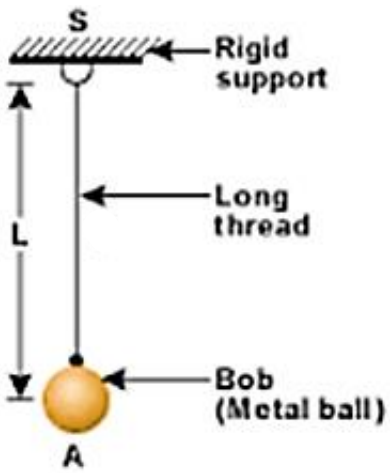

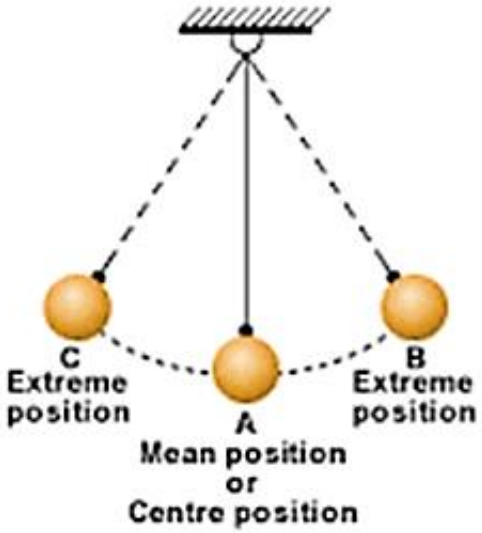

We know that $T = 2\pi\sqrt{\frac{l}{g}}$

$$\frac{\Delta T}{T} \times 100 = \frac{1}{2}\frac{\Delta l}{l} \times 100$$

If length is increased by 2%., time period increases by 1%.

NDA 2 2022 - Physics Marathon

Q) A string of 7 m length has a mass of 0.035 kg. If tension in the string is 60.5 N, then speed of a wave on the string is

(a) 77 m/s

(b) 102 m/s

(c) 110 m/s

(d) 165 m/s

SSBCrack EXAMS

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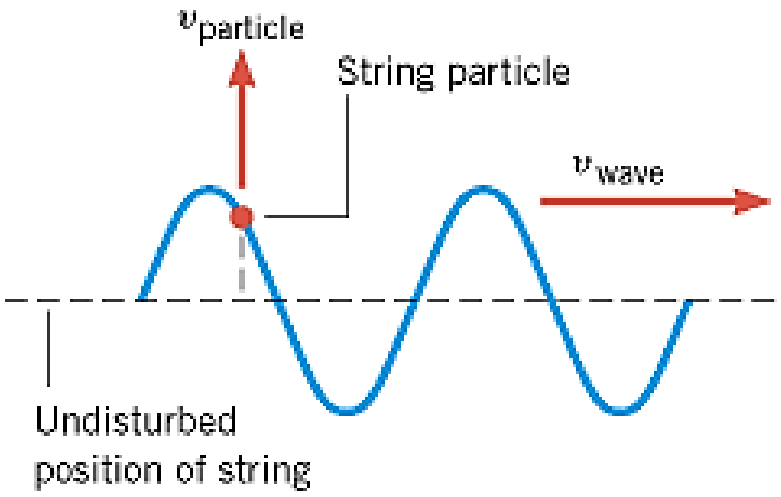
Given : Length (l) = 7 m

Mass (M) = 0.035 kg and tension (T) = 60.5 N. We know that mass of string per unit length (m)

$$= \frac{0.035}{7} = 0.005 \text{ kg/m}$$

and speed of

$$\text{wave} = \sqrt{\frac{T}{m}} = \sqrt{\frac{60.5}{0.005}} = 110 \text{ m/s}.$$



NDA 2 2022 - Physics Marathon

Q) The cause of heat production in a current carrying conductor is

(a) collisions of free electrons with one another

(b) high drift speed of free electrons

(c) collisions of free electrons with atoms or ions of the conductor

(d) high resistance value

SSBCrack EXAMS

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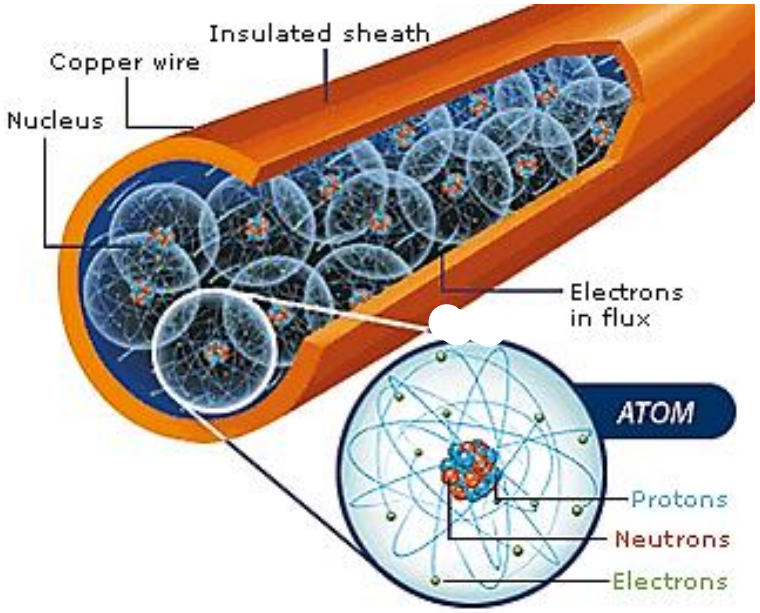
When current flows through a conductor electrons start moving in the opposite direction of current and collide with the metal atoms or ions in the conductor.



SSBCrack EXAMS

Q) How many internal reflections of light take place in the formation of primary rainbow?

(a) 0

(*b*) 1

(*c*) 2

(*d*) More than 2

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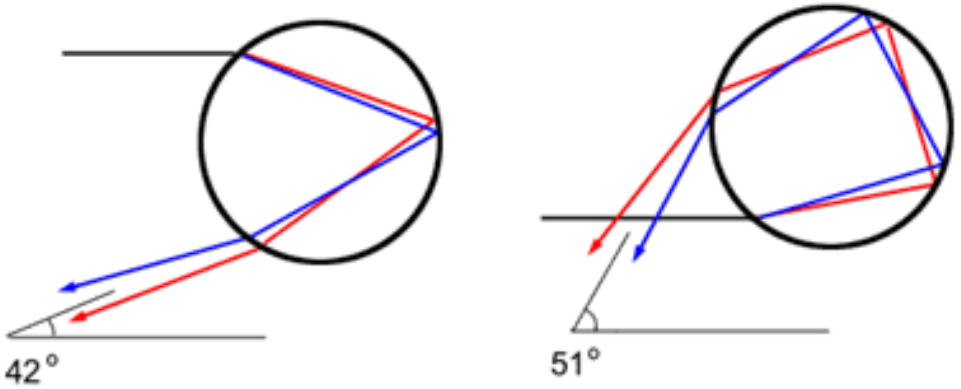

Primary Rainbow Secondary Rainbow

SSBCrack EXAMS

Q) The direction of acceleration in uniform circular motion is along the

(*a*) direction of motion.

(*b*) tangent to the circle at the point of observation.

(*c*) direction of velocity.

(*d*) direction perpendicular to velocity

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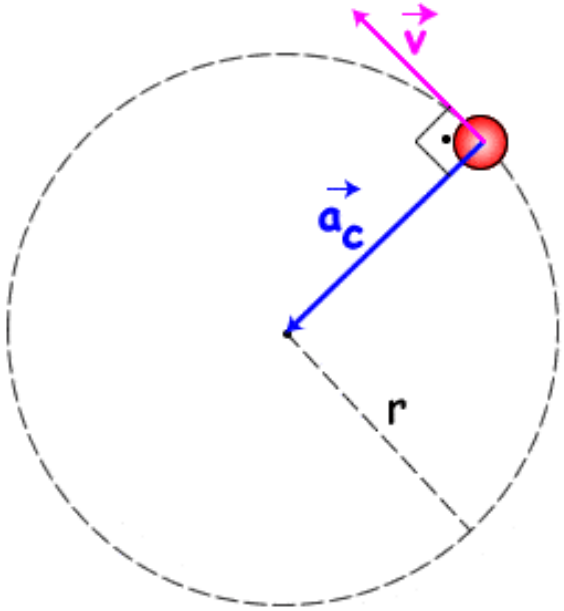

SSBCrack EXAMS

Q) The weight of an object is due to

(*a*) the net force acting on it.

(*b*) the total of all forces acting on it irrespective of their directions.

(*c*) the force that it exerts on the ground.

(*d*) its inert property.

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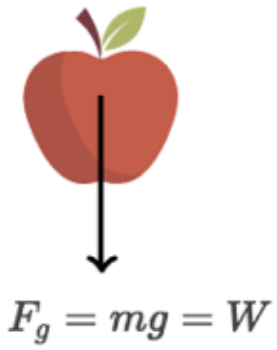
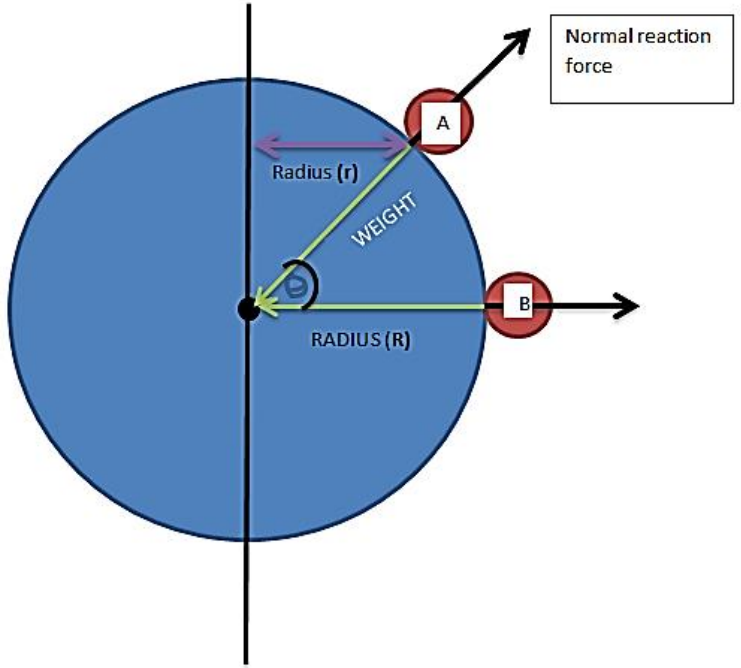


Weight is another word for the force of gravity



SSBCrack EXAMS

Q) The size of particles being studied in ‘nano-technology’ is about

(a) 1Å–10 nm

(*b*) 1–100 nm

(*c*) 1–50 μ

(*d*) 1 mm–10 mm

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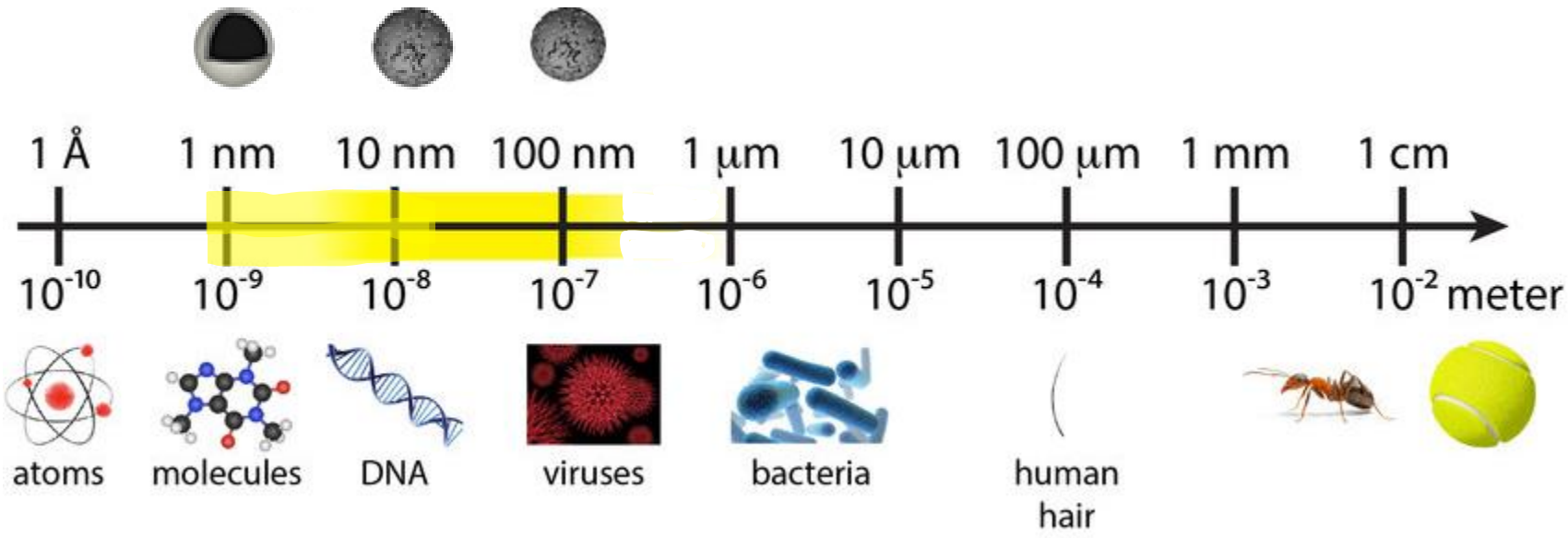

SSBCrack EXAMS

Q) An object weighs 9N on the surface of the Earth. What would be its weight, when measured on the surface of a planet where the acceleration due to gravity is 9 times that on the surface of the Earth?

(a) The weight would remain the same

(b) the weight would be equal to 1N

(c) the weight would become 9 times

(d) the weight will be reduced to $\frac{1}{9}N$

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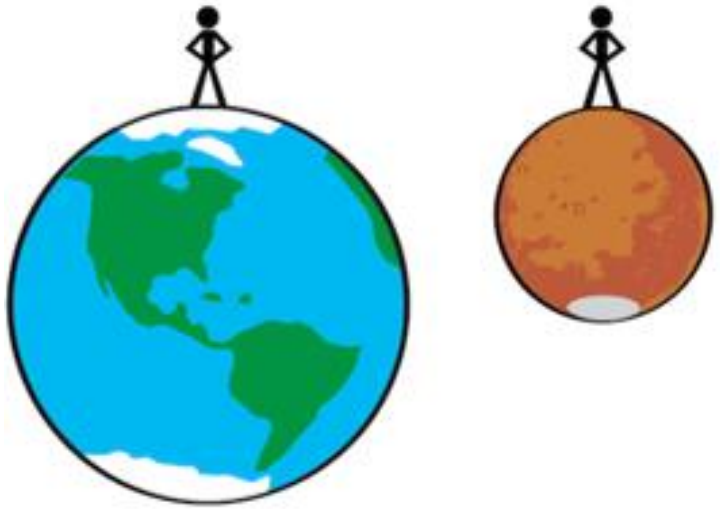

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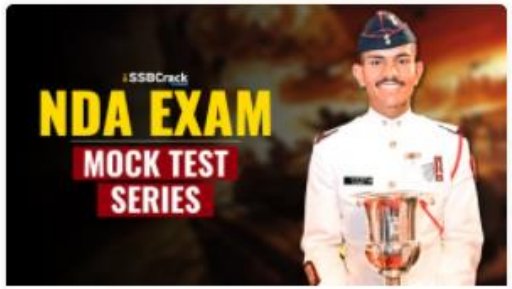

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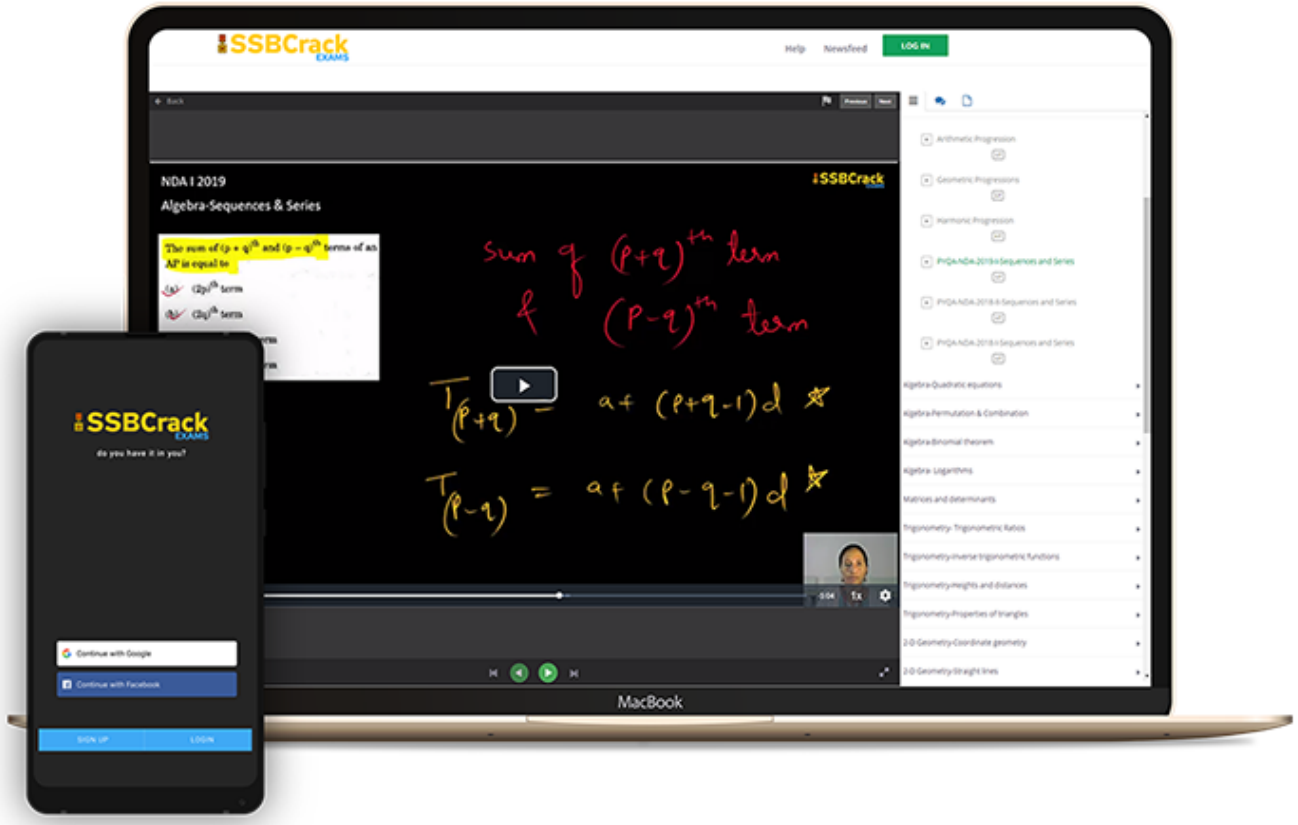

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