

Q No. 02

P(a)

Dengue is a viral infection caused by the dengue virus. It is transmitted through the bite of infected Mosquitoes.

Symptoms:

High fever, Severe headache
Pain behind the eyes, joint and muscle
Pain. etc.

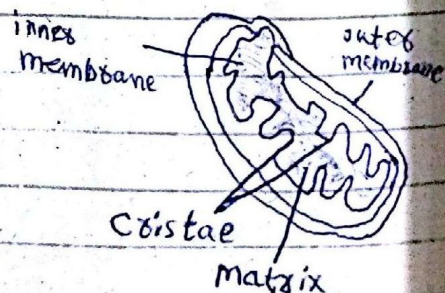
P(b)

Dark matter and Dark energy:

Dark matter and Dark energy are theoretical components of the universe and does not emit light. It makes up to 27% of the universe which makes it invisible. It is detected through its gravitational effects on visible matter. On the other hand, Dark energy accounts for 68%, is unknown force driving the accelerated expansion of the universe.

P(c)

Mitochondria:



Mitochondria are double-membraned organelles with an inner folded membrane called cristae. They produce energy in the form of ATP through cellular respiration, using nutrients and oxygen. Mitochondria are termed the powerhouse because they supply the majority of the cell's energy needs.

Q(d)

Covalent bonds are chemical bonds formed by the sharing of electron pairs between atoms. They can be single, double, or triple bonds, depending on the number of shared electron pairs. Single bond involve one pair, e.g. H_2 , while double bonds involve two pairs (e.g. CO_2) and triple bonds involve three pairs, e.g. NH_3 .

Q No. 04

P(a)

Noise Pollution:

Noise Pollution refers to the presence of excessive or unwanted sounds in the environment that can harm human health and wildlife.

Harmful Effects:

Human life:

Prolonged exposure to high noise levels can lead to hearing loss, stress, sleep disturbances, and increased risk of cardiovascular diseases.

Wildlife:

It can disrupt animal communication, navigation, and breeding patterns, leading to ecological imbalances.

Ways to curb:

Social Control:

Implementing noise barriers and using quieter machinery in industrial settings.

Urban Planning:

Designing cities to minimize noise exposure, such as incorporating green spaces and buffer zones.

Regulations:

Enforcing noise limits and standards for various environments.

PCB

Importance of Fiber in diet:

Dietary fibers aid in digestion, help maintain bowel health, and regulate blood sugar levels.

A balanced platter of food:

A balanced platter includes adequate

Carbohydrates, Proteins, fats, vitamins and ~~the~~ minerals, and fibers meet nutritional needs.

Drinking water Quality and Standards:

Drinking water quality is determined by factors like pH, Contaminants, and microbial presence. Standards are set by organizations like the WHO to ensure water safety, with limits on pollutants like lead, bacteria, and pesticides.

Lithosphere:

Lithosphere is earth's outermost layer, composed of the crust and upper mantle.

Rocks and minerals:

Rocks are solid aggregates of minerals, while minerals are naturally occurring inorganic compounds with a specific composition and structure.

Q No. 06 (A) (a)
Determine the value of 'k'

Sol:-

Since, arithmetic mean is,

$$\bar{X} = \frac{\sum X_i}{n}$$

and we have 9, 8, 10, K, 12 = 15

So,

$$X = \frac{9+8+10+K+12}{5} = 15$$

$$= \frac{39+K}{5} = 15$$

$$\begin{array}{r} 15 \\ \times 5 \\ \hline 75 \end{array}$$

$$39+K = 5(15)$$

$$39+K = 75$$

$$K = 75 - 39$$

$$K = 36$$

P (b)

Ratio of Sugar Solution and colored water is 4:3

⇒ After adding 10 liters of colored water becomes, 4:5

Find the initial amount of Sugar:

Sols-

Let the initial amount of Sugar solution to be 4x and colored water be 3x.

⇒ After adding 10 liters new ratio becomes:

$$\frac{4n}{3n+10} = \frac{4}{5}$$

$$4n(5) = 4(3n+10)$$

$$20n = 12n + 40$$

$$20n - 12n = 40$$

$$8n = 40$$

$$n = \frac{40 \cdot 5}{8}$$

$$n = 5$$

Thus, the initial quantity of the sugar solution is:

$$4n = 4 \times 5 = 20 \text{ liters.}$$

P(d)

To determine the next value in the given series that is:

-10, -8, 6, 40, 120

Lets look at the pattern between numbers:

1. from -10 to -8 increase by 2

2. from -8 to 6 increase by 14

3. from 6 to 40 increases by 34

4. from 40 to 120 increase by 62

each number is increasing by an additional 20:

$$2 + 12 = 14$$

$$14 + 20 = 34$$

$$34 + 28 = 62$$

$$62 + 32 = 94$$

$$102 + 94 = 196$$

So, the next number in the series is 196.

Q No. 07
P(a)

\Rightarrow If 20% of $x = y$,
the value of $y\%$ of 20 in
terms of x .

$$\text{Since } y = 0.2x$$

$$y\% \text{ of } 20 \text{ is } 0.2x$$

$$y\% \text{ of } 20 = \frac{y}{100} \times 20$$

$$= \frac{y}{5} \quad \text{--- (1)}$$

Substitute $y = 0.2x$ in equation (1)

$$= \frac{0.2x}{5} = \quad \left(\because \frac{1}{5} = 0.2 \right)$$

$$= 0.2x (0.2)$$

$$= 0.04x$$

So, $y\%$ of 20 in terms of x
is $0.04x$.

P(b)

Given that:

$$\frac{P+Q}{2} = 5050$$

$$P+Q = 2(5050) = 10100$$

Q and R have average monthly income of 6250

So,

$$\textcircled{2} \frac{Q+R}{2} = 6250$$

$$Q+R = 2(6250) = 12500$$

P and R have average monthly income of Rs. 5200

$$\frac{P+R}{2} = 5200$$

$$P+R = 2(5200) = 10400$$

Let's add $P+Q$ and $Q+R$.

$$P+Q+P+R = 10400 + 12500$$

$$2P+Q+R = 20500 \rightarrow \textcircled{1}$$

Putting $Q+R = 12500$ in eq $\textcircled{1}$

$$2P + 12500 = 20500$$

$$2P = 20500 - 12500$$

$$2P = 8000$$

$$P = \frac{8000}{2}$$

$$P = 4000$$

Thus, the monthly salary of P is 4000.

PCCJ

To find the probability of each event when two coins are tossed 500 times, we use the formula

$$\text{probability of an event} = \frac{\text{No. of times event}}{\text{Total No. of trials}}$$

Since,

Two heads occurs 105 times

one head occurs 275 times

No head occurs 120 times

So,

1. The Probability of getting two heads:

$$= \frac{105}{500} = \frac{21}{100} = 0.21$$

2. The Probability of one head is:

$$= \frac{275}{500} = \frac{55}{100} = 0.55$$

3. The Probability of getting no head:

$$= \frac{120}{500} = \frac{24}{100} = 0.24$$

P(d)

Let, Jamie's age represents J and d represents dad's age.

⇒ Jamie's dad is 4 times older than Jamie.

$$d = 4j$$

⇒ In 14 years, Jamie's dad will be twice than the age of Jamie

$$d + 14 = 2(j + 14) \quad \text{--- (1)}$$

substitute $d = 4j$ in equation (1)

$$4j + 14 = 2j + 28$$

$$4j - 2j = 28 - 14$$

$$2j = 14$$

$$j = \frac{14}{2} = 7$$

$$\boxed{j = 7} \quad \text{--- (2)}$$

So,

Jamie's age = 7 years

since,

$$d = 4j \quad \text{--- (3)}$$

putting $j = 7$ in equation (3)

$$d = 4(7)$$

$$\boxed{d = 28}$$

The sum of their ages:

$$j + d = 7 + 28 = 35$$

So,

The sum of their current ages is 35 years.