Q. No. 6

a. Determine the 'K' ... ?

Solution

Given Data:

Various values : 9, 8, 10, K, 12

their Arithmatic mean (A.M) = 15

Arithmatic mean (A.M) = $\frac{\text{Sum of all terms}}{\text{No of terms}}$ ——— (1)

value of K =?

Solution:

Arithmatic Mean = $\frac{\text{Sum of all terms}}{\text{total Number of terms}}$

putting values from given Data

Eq (1) becomes

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

Multiplying both sides with 5

$$15 \times 5 = 39 + K$$

$$75 = 39 + K$$

subtracting 39 on both sides:

$$75 - 39 = 39 - 39 + K$$

$$\boxed{36 = K}$$

Thus value of K is 39.

b. A mixture ?

Given Data

Ration of sugar and colored water = 4:3

No of Liters of water added = 10

Ratio after water addition = 4:5

Initial quantity of sugar = ?

Solution

Since ratio of sugar and colored water is 4:3, we can assume that initial quantities of sugar solution = 4x ——— (1)

Initial quantity of colored solution = 3x

After addition of 10 Liter of colored water, Ratio becomes

4:5. So we can write for

~~Calculated solution~~

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

Multiplying $4x$ on both sides

$$4x \times \left(\frac{3x+10}{4x}\right) = \frac{5x}{4x} \times 4x$$

$$3x + 10 = 5x$$

Subtracting $3x$ on both sides

$$3x - 3x + 10 = 5x - 3x$$

$$10 = 2x$$

dividing by 2 on both sides

$$\frac{10}{2} = \frac{2x}{2}$$

$$\boxed{5 = x}$$

putting value of x in Eq (1)

Initial quantity of sugar water in solution = 4×5

$$= \boxed{20 \text{ Liters}}$$

Thus initial quantity of sugar solution in mixture is 20 Liters.

C. volume of football ... ?

Given Data

Radius of football = r = 12 cm ... (1)

volume of football = V = ?

Solution

Formula for volume of sphere

$= \frac{4}{3}\pi r^3$

Since football is sphere in shape

So it volume $= \frac{4}{3}\pi r^3$ — (2)

putting value of r from Eq (1) and using value of π as $\frac{22}{7}$ Eq (2) becomes

Volume of football $= V = \frac{4}{3} \times \frac{22}{7} \times (12)^3$

$= \frac{4}{3} \times \frac{22}{7} \times 12 \times 12 \times 12$

$= \frac{50688}{7}$ cm^3

Volume of football $V \approx 7241.1$ cm^3

Thus volume of football is approximately 7241.1 cm^3

d. Given a series. - - ——

Given Data

terms of the Series = -10, -8, 6, 40, 102, ?

Number that comes in place of ? = unknown

Solution

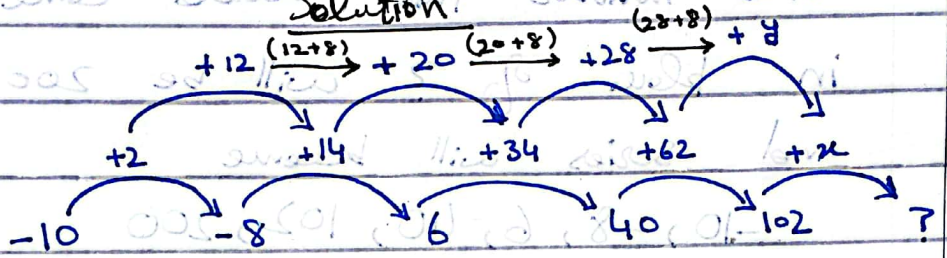


figure 6d (1)

Careful examination of series reveals that each next term of series is achieved by addition of 8 into the increament that was added into from the previous term.

from the figure 6d(1), we know that

$$? = 102 + x \quad —①$$

where as $x = 62 + y \quad —②$

where as $y = 28 + 8$

$$\boxed{y = 36}$$

putting value of y in Eq ②

$$x = 62 + 36$$

$$\boxed{x = 98}$$

putting value of x in eq (1)

$? = 102 + 98$

$\boxed{? = 200}$

Thus number that would come in place of ? will be 200 and series will become

$-10, -8, 6, 40, 102, 200$

Q. No. 7

a. If 20% of x = y

Value of y% of 20 in term of x = ?

Given Data

20% of x = y

value of y% of 20 in term of x = ?

Solution

we know that

20% of x = y — (1)

As % = $\frac{1}{100}$ unit so Eq ①

becomes $20 \times \frac{1}{100} \times x = y$

$\frac{x}{5} = y$ — ②

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

value of y% of 20 = $\frac{y}{5}$ — ③

putting value of y from Eq ② into Eq ③

Value of y% of 20 = $\frac{x}{5} \times \frac{1}{5}$

Value of y% of 20 = $\frac{x}{25}$

Thus value of y% of 20 in terms of x is $\frac{x}{25}$

b. P and Q. . . . . ?

Given Data:

Average monthly salary of P and Q = 5050 Rs — (1)

" " " " Q and R = 6250 Rs — (2)

" " " " P and R = 5200 Rs — (3)

Monthly salary of P = ?

Solution:

We know that

$$\text{average} = \frac{\text{Sum of terms}}{\text{No of terms}}$$

So Eq (1) becomes

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

Multiplying with (2) on both sides

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

$$10100 = P+Q \quad \text{— (4)}$$

Eq (2) becomes

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

Mutliplying by 2 on both sides

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

$$12500 = Q+R \quad \text{— (5)}$$

Eq (3) becomes

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

Multiplying with 2 on both sides

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

$$P+R = 10400 \quad \text{— (6)}$$

Subtracting R on both sides

$$P+R-R = 10400 - R$$

$$P = 10400 - R \quad \text{— (7)}$$

Subtracting Q on both sides of (5)

$$12500 - Q = Q+R-Q$$

$$12500 - Q = R \quad \text{— (8)}$$

Putting value of R in Eq (7)

$$P = 10400 - 12500 + Q \quad \text{— (8)}$$

Subtracting P on both sides of (4)

$$10100 - P = P+Q-P$$

$$10100 - P = Q \quad \text{— (9)}$$

Putting value of Q in Eq (8)

$P = 10400 \div 12500 + (10100 - P)$

$P = 10400 \div 12500 + 10100 \div P$

adding P on both sides

$P + P = 8000 - P + P$

$2P = 8000$

deviding by 2 on both sides

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

$\boxed{P = 4000 \text{ Rs}}$

This monthly salary of P is Rs 4000.

C. Two coins are tossed 500 times

Given Data

Total number of times two coins are tossed = 500

Number of times 2 heads come = 105

" " " 1 head comes = 275

" " " no head comes = 120

probability of each event to occur = ?

Solution

Probability of an event = $\frac{\text{total outcomes}}{\text{No of times that event occurs}}$ — (1)

So from given data putting values in Eq (1)

Probability of two heads = $\frac{500}{105}$

=

Probability of an event = $\frac{\text{No of times that event occurs}}{\text{total outcomes}}$ — (1)

For two heads, putting values from given data in Eq (1)

Probability of two heads = $\frac{\text{No of times 2 heads come}}{\text{total times coins are tossed}}$

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

Probability of two heads = $\frac{21}{100}$

For one head Eq (1) becomes

Probability of one head = $\frac{\text{No of times 1 head comes}}{\text{total coin tosses}}$

$= \frac{2755}{500} \times \frac{}{100}$

Probability of one head = $\frac{55}{2000} = \frac{11}{20}$

For no head Eq ① becomes

∴ Probability of no head = $\frac{\text{No of times no head comes}}{\text{total coin tosses}}$

$= \frac{120}{500} = \frac{24}{100} = \frac{6}{25}$

Probability of no head = $\frac{6}{25}$

d. Jamie's dad - - - - -

Given Data

Let Jamies' age = J

Jamies dad age = D

Jamies' Dad is four times older than Jamie, it means we can write ... $D = 4 \times J$ — (1)

After 14 years, Jamie's dad will be twice of age than Jamies, So we can write

$D + 14 = 2 \times (J + 14)$ — (2)

Sum of Jamies age and his dad's age now = ?

James age now = J + 14

James dad age now = D + 14

Sum of their ages = (J+14) + (D+14)

= J + D + 28 — (3)

In order to find J and D's values, we will use eq (1) and (2) from given conditions.

Eq (1) => D = 4J

Eq (2) => D + 14 = 2 × (J+14)

D + 14 = 2J + 28

Subtracting 14 on both sides

D + 14 - 14 = 2J + 28 - 14

D = 2J + 14. — (4)

putting value of D from eq (1)

4J = 2J + 14

Subtracting 2J on both sides

4J - 2J = 2J - 2J + 14

2J = 14

deviding by two 2 on both sides

$\frac{2J}{2} = \frac{14}{2}$

$\boxed{J = 7}$

putting value of J in Eq (4)

$D = (2 \times 7) + 14$

$= 14 + 14$

$\boxed{D = 28}$

(5) — putting values of J and D in eq (3)

(6) Sum of Janie and his dad's ages now $= 7 + 28 + 28$

$= \boxed{63}$

Thus sum of Janie and his dad's current age now is 63.

Q. No. 2

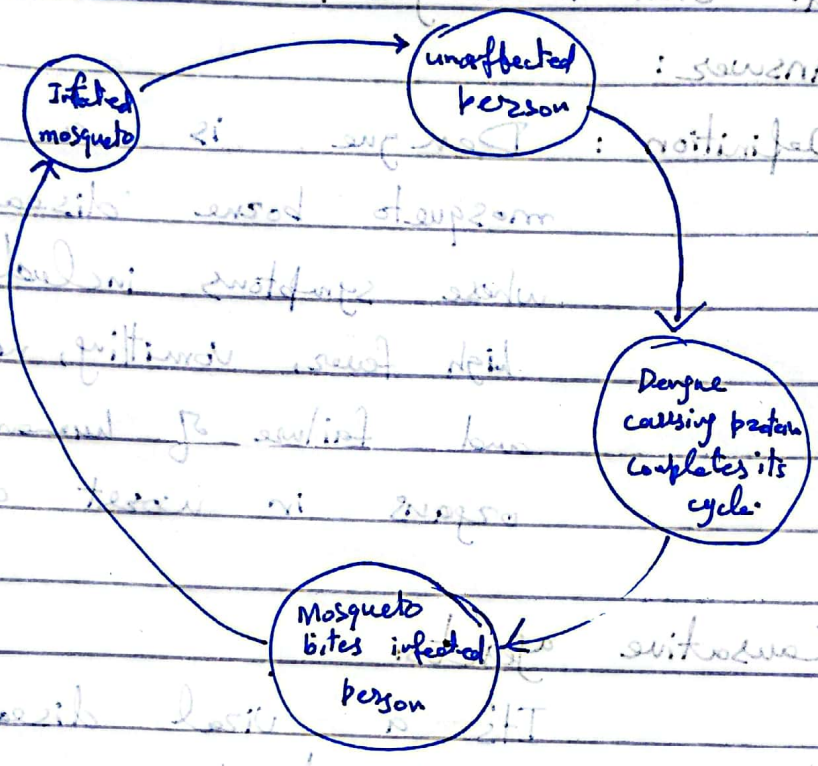
a. what is dengue ? - - - .

Answer :

Definition : Dengue is a mosqueto borne disease whose symptoms include high fever, vomitting, nausea and failure of human organs in worst cases

Causative agents:

It's a vizal disease. It is spread by mosquetos of special kind known as Ades Agypty. Infected mosqueto transmit the protein into & people it bite. The protine completes its cycle inside body of the host and causing him dengue in this process. When a mosqueto bites the infected person it transmits the disease from his blood to next person. it bites.



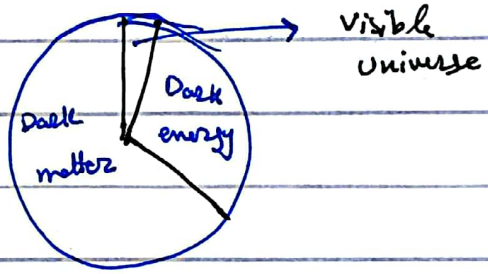
Dengue bird Cycle.

Symptoms:

1- High fever
2- Head ache
3- Vomiting
4- Nausea
5- Multible organ failure in worst cases

b- Dark Matter and Dark Energy

Dark matter and dark energy collectively make around 97% of our universe. They are called dark, as they do not reflect light and hence cannot be seen

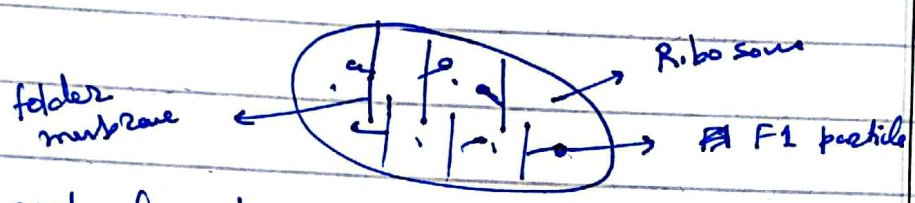


How Dark matter and Energy are Detected ?

They are detected due to their high magnetic field and mass bending the light and time space around them.

c. Mitochondria

Structure



Mitochondria is a membrane bound organelle that is found within cytoplasm of the cell. It has folded membrane, with F1 particles sticking out of it and fewer ribosomes used for protein synthesis

Function

1- It provide energy to the cell to conduct its functions
2- Helps in cell respiration
3- Facilitates Kerb cycle.
4- Provides assistance in metabolic processes.

Why is it power house of cell ?

Since it facilitates

processes that are involved in releasing energy i:e respication, metabolic, Kerb cycle, it provides energy to the cell in form of ATP. which upon usage at appropriate time get converted into ADP. Mitochondria again converts it to ATP and act as source of power to cells. That is why it is called power house of cell.

d- Covelent Bond

Bonds between atoms that are formed due to sharing of electron pairs.

Reason of covelent Bond formation

Atoms share bond to attain electronic configuration of nearest noble gas and attain stability

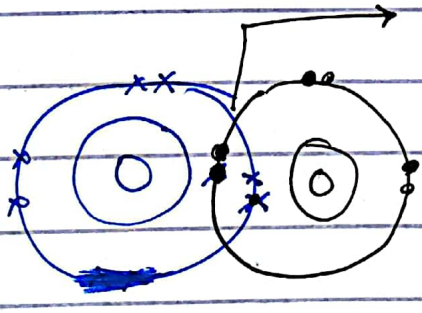
by doing so.

What kind of atoms form covelent Bond.

Matelic and non matelic atoms form bond by sharing electron pair.

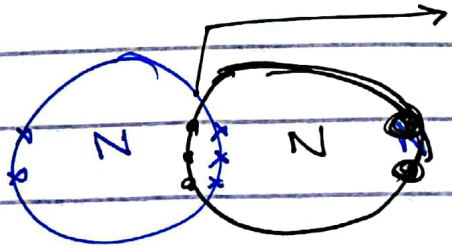
Structures after Covelent Bond.

Oxygen gas



O_2 forms double covelent bond by sharing electons

Nitrogen gas

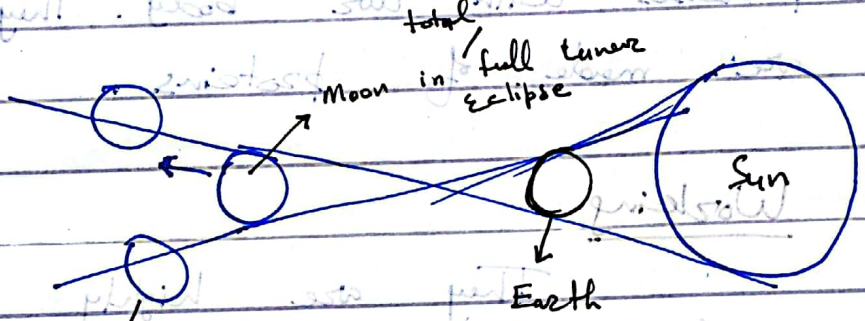


N_2 forms tripple covelent bond by sharing 3 electron pairs.

Q. No. 3

a- Lunar Eclipse

When Earth comes between sun and Moon, it casts its shadow upon moon. This phenomenon is called Lunar Eclipse.



Total Lunar Eclipse

When the Earth's shadow completely blocks moon, its said to be in total Lunar eclipse.

Partial Lunar Eclipse

When earth's shadow

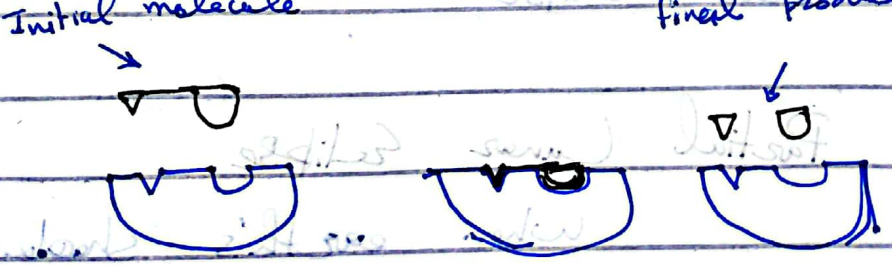
only partially covers the moon, its called partial lunar eclipse.

b- Enzymes

Enzymes are catalysts that increase the rate of various chemical processes with our body. They are made of proteins.

Working

They are highly specific and allow only certain kind of molecules to be processed. Molecule attaches itself to specific site on enzyme and enzyme converts it into smaller products by breaking it down.



examples

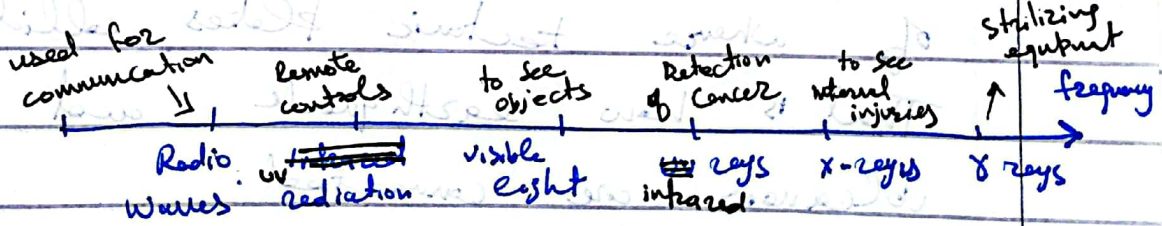
Trypsin → converts proteins into amino acids in digestive system

Amylases → Convert Lips into fatty acids

C- Electromagnetic Radiation

Electromagnetic radiations are waves that transfer energy due to changing electric and magnetic field. They vary in type based upon their wavelength.

EMR Spectrum

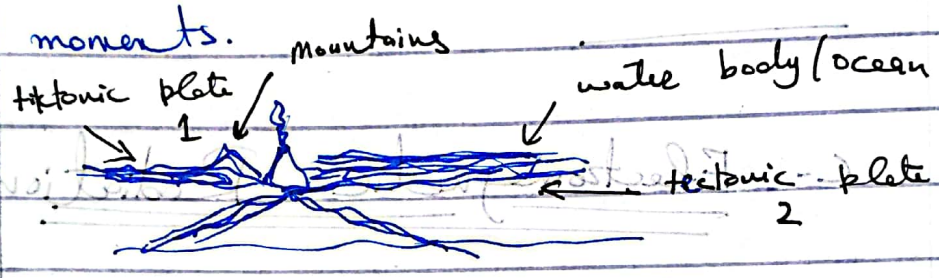


Based upon the frequency / wavelength Electromagnetic Radiations form a spectrum show above, known as EMR spectrum

d.

Interconnection of Earth quakes and volcanic erruption.

They both are connected to tictonic plate movements.



When tectonic plate under ocean comes in contact with terrestrial tectonic plate, their friction causes earth quack, while ocean water gets through creeks and lowers boiling point of mantle, which comes out as lava from volcanic holes on the boundry of where tectonic plates collide. That is how earth quack and volcanoes are connected.