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Q No 8

(a)

Brain is a window cleaner. He uses the following formula to calculate the amount to charge his customer

$$\text{Charge} = £20 + 4n$$

Where 'n' is the number of windows in a house. If a house has 7 windows, how much would Brian charge?

Solution:

Given

$$\text{Charge} = £20 + 4n$$

put $n = 7$

$$\text{Charge} = £20 + 4(7)$$

$$\text{Charge} = £20 + 28$$

$$\text{Charge} = £48$$

Brian charge £48 to his customer.

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(b)

Find out words from given jumbled wo spellings.

i) ralciep = replica

ii) tyhniaum = humanity

iii) arsencc = ~~ccar~~ creachs, search

iv) moniteah = amnihote

v) tareph = tephra

(c)

Verify $(A \cup B)' = A' \cap B'$

$A = \{10, 11, 12, 13, 15\}$
$B = \{10, 12, 14\}$
$U = \{10, 11, 12, 13, 14, 15, 16, 18\}$

Solution.

L.H.S = $(A \cup B)'$

~~$A \cup B$~~ $\neq \xi$

L.H.S = $U - (A \cup B)$

putting values, we get

L.H.S = $\{10, 11, 12, 13, 14, 15, 16, 18\} -$
$(\{10, 11, 12, 13, 15\} \cup \{10, 12, 14\})$

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L.H.S = {10, 11, 12, 13, 14, 15, 16, 18} − {10, 11, 12, 13, 14, 15}

L.H.S = {16, 18} ⟶ (1)

Now

R.H.S = A' ∩ B'

R.H.S = (U − A) ∩ (U − B)

Putting values we get

R.H.S = ({10, 11, 12, 13, 14, 15, 16, 18} − {10, 11, 12, 13, 15})
∩ ({10, 11, 12, 13, 14, 15, 16, 18} − {10, 12, 14}

R.H.S = {{14, 16, 18} ∩ {11, 13, 15, 16, 18}

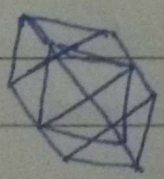
R.H.S = {16, 18} ⟶ (2)

Hence from (1) & (2)

L.H.S = R.H.S verified

(d)

Find number of triangles in the given figure.



Solution.

Total number of triangle = 8 + 10 + 6

= 24 Ans.

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Q.No 6

Determine the value of 'k' if the arithmatic mean of 9, 8, 10, k, 12 is 15.

Solution.

To find:

$k = ?$

Calculation:

We know that

Arithmatic mean = $\frac{\text{Sum of all observation}}{\text{no of observation}}$

putting values, we get;

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

Multiplying '5' on both sides;

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

$$75 = 9+8+10+k+12$$

$$75 = 39+k$$

$$\Rightarrow k = 75-39$$

$$\boxed{k = 36}$$

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Hence value of k is 36.

(b)

A mixture contains sugar solution and colored water in ratio of 4:3. If 10 litres of colored water is added to mixture, the ratio becomes 4:5 Find initial quantity of sugar solution in the given mixture.

Solution.

Let

initial quantity of sugar = $4x$

initial quantity of colored water = $3x$

After adding ~~water~~ 10 litres of colored water

Final quantity of colored water = $3x+10$

~~Given ratio~~

The ratio become

$$4x : 3x+10 = 4 : 5$$

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

By Cross multiplication, we get

$$4x \times 5 \quad 4 \times (3x+10)$$

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$$20x = 12x + 40$$

$$20x - 12x = 40$$

$$8x = 40$$

÷ing '8' on both sides;

$$\frac{8x}{8} = \frac{40^{5}}{8_{1}}$$

$$x = 5$$

Initial quantity of sugar solution = $4x$

putting value of $x = 5$

initial quantity of sugar solution = 4×5

$= 20$

Hence the initial quantity of sugar solution is 20 litres.

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(C)

What will be volume of football with a radius of 12cm?

Solution

To find:

$V = ?$

Calculation:

We know that

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

putting value of 'r' in above equation

$$V = \frac{4}{3} \times \left(\frac{22}{7}\right) \times (12\text{cm})^3$$

$$V = \frac{4 \times 22 \times 64\ cm^3}{7}$$

$$V = \frac{88 \times 64\ cm^3}{7}$$

$$V = \frac{5632\ cm^3}{7}$$

$$\boxed{V = 804.57\ cm^3}$$

Hence, the volume of football is $804.57 cm^3$

(d)

Given a series;-
$-10, -8, 6, 40, 102, ?$

Find what number would come in place of question mark(?).

Solution.

$-10 + 2 = -8$

$-8 + 14 = 6$

$6 + 34 = 40$

$40 + 62 = 102$

$102 + 92 = 200$

Hence, the number that would come at the place of question mark is 200.

Section: I

Q NO 2

(d)

What is covalent bond? Explain

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types along with elaborating structure?

Ans.

Covalent Bond:

The bond that is formed by mutual sharing of electrons between two non-metal atoms it is called covalent bond. There are five types of covalent bond which are single covalent bond, double covalent bond, triple covalent bond, polar covalent bond and non-polar covalent bond. This type of bond exists in solid, liquid and gaseous state.

Types of Covalent Bond:

1- Single-covalent Bond:

This type of bond is formed by sharing single electron and it is denoted by a single line between two atoms.

Example:

H_2, HCl

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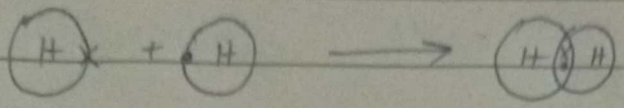


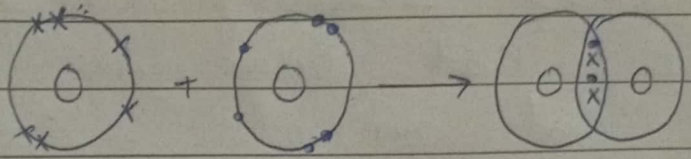
H — H

2- Double Covalent Bond:

This type of covalent bond is formed by sharing two electrons between atoms. It is denoted by double line between two atoms.

Example:

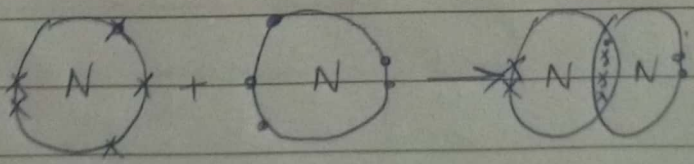
O_2 , CO_2



O = O

3- Triple Covalent Bond:

This type of bond is formed by sharing three electrons between atoms. It is represented by three lines between atoms.



N ≡ N

4- Polar Covalent Bond:

This bond is formed by unequal sharing of ectrons due to difference in

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electronegativity ~~at~~ of combing atoms.

Example:
Hydrogen Bonding

5- Non-Polar Covalent Bond:

This type of bond is formed by equal sharing of electrons

Example:
Hydrogen gas, nitrogen gas etc.

(C)

Discuss structure and function of mitochondria. How ~~its~~ it is the powerhouse?

Ans.

Function of Mitochondria:

Mitochondria primary function is to ~~promote~~ produce energy. Beside this, it also regulative metabolic activity of the cell. It also promoted cell multiplication and cell growth. ~~At~~ It also

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detox ammonia in the cell. Moreover it play an important role in programmed cell death.

Mitochondria is a Powerhouse:

The proteins synthesis from the proteins of mitochondria generate ATP (Adenosine tri-phosphate). This ATP acts as a energy currency of the cell, because of which whole cell and body gets energy. Thus, mitochondria is called powerhouse of cell.

(b)

Explain Dart matter and Dark energy.

Ans.

Dark Matter:

Invisible matter That exerts gravity, holding galaxies and other cosmic structures together Dark matter is responsible for the organisation of galaxies on large scale

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Dark energy:

Both dark matter and dark e

Dark energy is the name we give the mysterious influence driving the accelerated expansion of the universe. example GN-z11 galaxy.

Together dark matter and dark energy make up almost 95% of universe.

Q NO 3

(a)

What is lunar Eclipse? Explain in detail with structure.

Ans:

Lunar Eclipse:

When the earth moves between sun and the moon, and earth blocks the sunlight of sun at that time lunar eclipse occur. A lunar eclipse can be seen from earth. It occurs when the moon is full

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Types of Lunar Eclipse:

1- Penumbral Lunar Eclipse:

In this type, the moon only passes through penumbra of Earth shadow. It is rarely visible.

2- Partial Lunar Eclipse:

It happens when part of Moon passes through umbra of Earth. In this the shadow is not obscured completely.

3- Total Lunar Eclipse:

It happens when part of Moon passes through a umbral region of Earth and this obscured the shadow totally

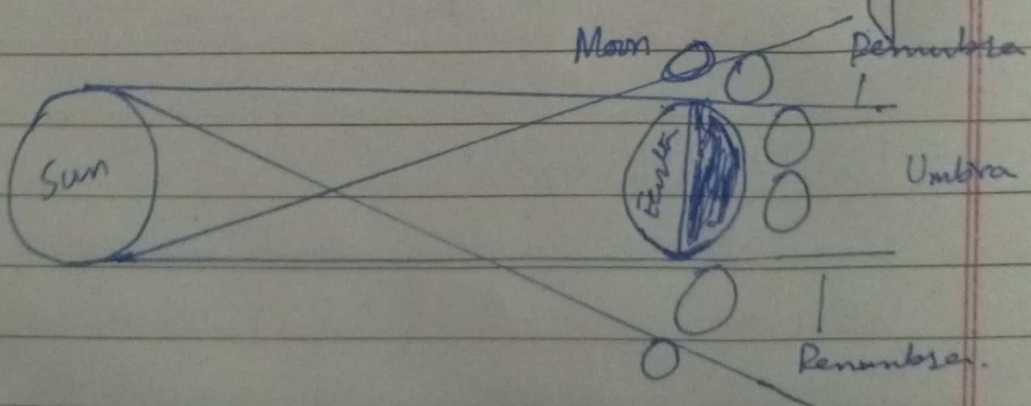

Fig: Lunar Eclipse