Date: 29th Oct, 2024 Day: Tuesday.

Minal Emad-068

"MOCK EXAM - 05"

"GENERAL SCIENCE AND ABILITY"

SECTION - I

"Question 2."

part (d)

Ans: **Covalent Bonds:**

"The bonds that are formed by the mutual sharing of electrons are called covalent bonds."

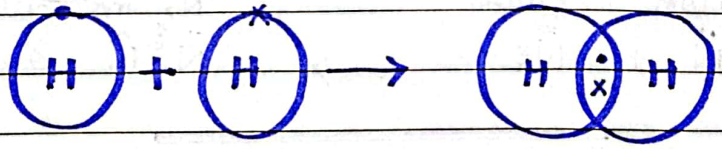
Types of covalent bonds:

Covalent bonds have many types. For example

(i) **Single Covalent bond:**

The bond that is formed by the mutual sharing of a single electron pair is called single covalent bond. It is represented by a single line (—) between two atoms.

For example, there is a single covalent bond is H_2 molecule which can be represented as



H atom H atom H_2 molecule

$\dot{H} + \dot{\underset{\times}{H}} \longrightarrow H:H$ or $H-H$

(ii) **Double Covalent bond:**

The bond that is formed by the mutual sharing of two electron pair is called a double covalent bond. It is represented by a double line (=) between two atoms.

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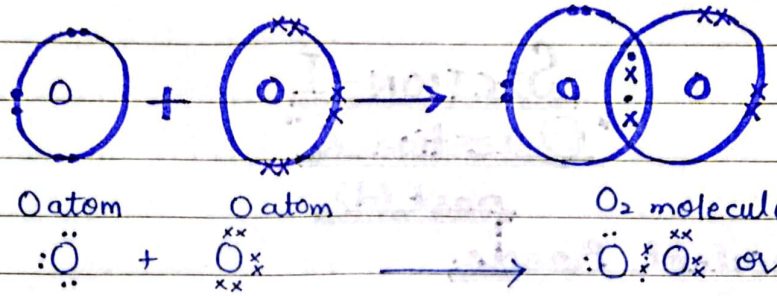
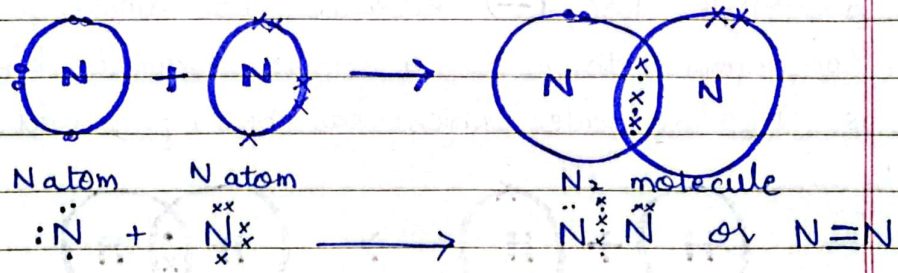
For example, there exist a double covalent bond in O_2 molecule which is represented as:



(iii) **Triple covalent bond:**

The bond that is formed by the mutual sharing of three electron pair is called triple covalent bond. It is represented by a triple line ($\equiv$) between two atoms.

For example, there exist a triple covalent bond in N_2 molecule which is represented as.



"Question 3"
part (a)

Ans: **Introduction:**

"An eclipse occurs when there is a syzegy (when three or more astronomical bodies come in a straight line configuration)."

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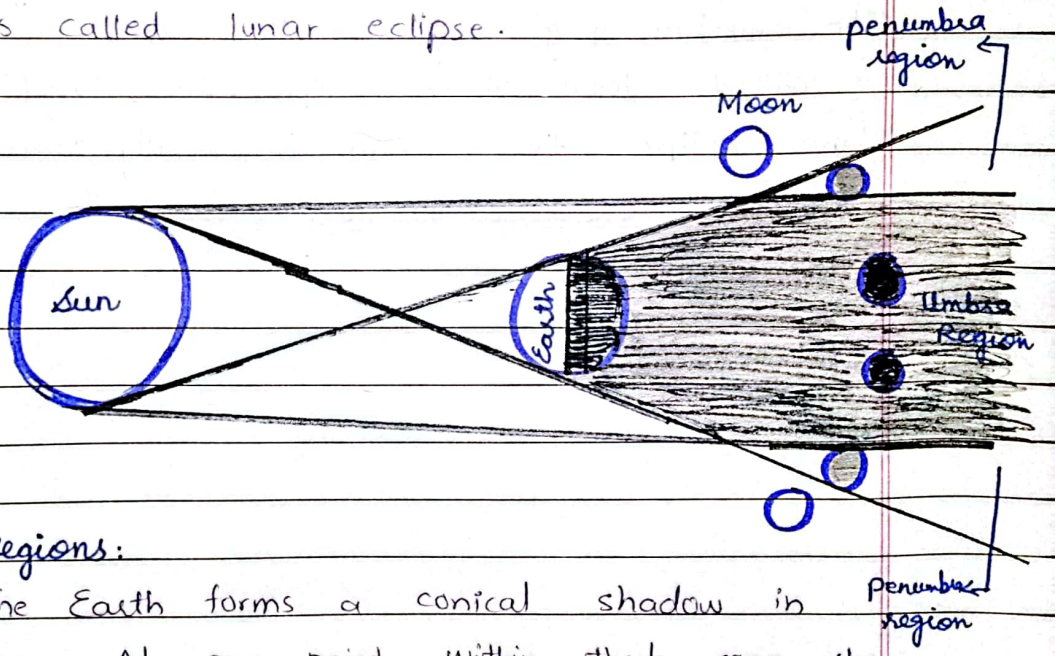
Lunar Eclipse:

The moon revolve around earth and at the same time earth orbits the sun. Sometimes the earth comes between the moon and the sun. When this happens, earth blocks the sunlight reaching the moon (the light that causes the moon the shine). So instead of sunlight, the dark shadow of earth falls on the moon. This is called lunar eclipse.



Regions:

The Earth forms a conical shadow in space. At any point within that cone the light is wholly obscured. Surrounding the shadow cone also called umbral region is a region of partial shadow called penumbral region.

Types of eclipse:

(i) **Penumbral lunar eclipse:** When the moon only passes through the penumbra of earth shadow, it is called penumbral lunar eclipse. It is rarely visible from earth

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as there is slight change in colour.

(ii) **Partial lunar eclipse:**

When only a part of moon passes through the umbra region of earth shadow, it is called partial lunar eclipse. as its whole area is not obscured by the shadow.

(iii) **Total lunar eclipse:**

When the entire moon passes through the umbra region of earth shadows it is called total lunar eclipse. In total lunar eclipse the moon is totally obscured.

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SECTION – II

"Question 6"

part (a)

Given Data:

Arithmetic mean = 15

no of values = 5

values = 9, 8, 10, k, 12

To find:

k value = ?

Solution:

$$\text{Arithmetic mean}(\bar{X}) = \frac{\text{Sum of all values } (\leq X)}{\text{number of all values } (n)}$$

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

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

$$75 = 39 + k$$

$$75 - 39 = k$$

$$\boxed{36 = k}$$

Conclusion:

The value of k is 36.

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part (b)

Given Data:

Ratio of sugar solution to colored water = 4:3

Amount of colored water added = 10 liters

New / Resultant Ratio = 4:5

To find:

Initial quantity of sugar solution = ?

Solution:

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Initial ratio of sugar solution and colored water is $4x : 3x$ or $4x / 3x$

Now 10 liters of colored water is added so:

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

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

$$20x = 12x + 40$$

$$20x - 12x = 40$$

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

$$\boxed{x = 5}$$

As ratio of sugar solution was $4x$ so quantity of sugar solution will be $4 \times 5 = \boxed{20}$

Conclusion:

Initial quantity of sugar solution is 20.

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part (c)

Data:

Radius of football = 12 cm

To find:

Volume of football $V = ?$

Solution:

As football has a shape of sphere so ↑ formula for volume of sphere will be used. in order to find the volume of football.

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

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

$$V = \left(\frac{4}{3}\right)(3.14)(144 \times 12)$$

$$\boxed{V = 7107.76\ cm^3}$$

$\therefore \pi = \frac{22}{7}$

Or ≈ 3.14

Conclusion:

The volume of football is $7107.76\ cm^3$.

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part (d)

Given Data:

Series = $-10, -8, 6, 40, 102, ?$

To find:

The missing number = ?

Solution:

$$-10, \underset{2}{-8}, \underset{14}{6}, \underset{34}{40}, \underset{62}{102}, \underset{98}{?}, \boxed{200}$$

$$\underset{12}{2}, \underset{20}{14}, \underset{28}{34}, \underset{36}{62}, \underset{8}{98}$$

$$\underset{8}{12}, \underset{8}{20}, \underset{8}{28}, \underset{8}{36}$$

Conclusion:

The missing number in series is 200.

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"Question 7"
part (a)

Given Data:

20% of $x = y$

To find:

y% of 20 in terms of x

Solution:

$$20\% \cdot x = y$$

$$\frac{20}{100} x = y \quad \text{—(i)}$$

$$y\% \ 20 = ? \text{ value} \quad \text{—(ii)}$$

Put value of eq (i)(y) in eq(ii)

$$y\% \ 20 = \text{value} \qquad \therefore y = \frac{20}{100} x$$

$$\left(\frac{20}{100} x\right)\% \times 20 = \text{value}$$

$$\left(\frac{20}{100} x\right) \frac{1}{100} \times 20 = \text{value}$$

$$\frac{400x}{10000} = \text{value}$$

$$\frac{4}{100} x = \text{value } (y)$$

$$\boxed{0.04x = \text{value } (y)}$$

Conclusion:

So y% of 20 in terms of x is 0.04.

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past (b)

Given Data:

P and Q average salary = Rs 5050

Q and R average salary = Rs 6250

P and R average salary = Rs 5200

To find:

Monthly salary of P = ?

Solution:

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

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

$$\boxed{P+Q = 10100} \quad \text{—(i)}$$

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

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

$$\boxed{Q+R = 12,500} \quad \text{—(ii)}$$

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

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

$$\boxed{P+R = 10400} \quad \text{—(iii)}$$

Now subtracting eq. (i) and (iii)

$$P+Q = 10100$$
$$\pm P \pm R = \pm 10400$$
$$Q-R = -300 \quad \text{—(iv)}$$

Now adding eq (ii) and (iv)

$$Q+R = 12500$$
$$Q-R = -300$$
$$2Q = 12,200$$

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$$2Q = 12{,}200$$
$$Q = \frac{12{,}200}{2}$$
$$Q = 6100$$

Put the value of Q in eq (i)

$$P + Q = 10100$$
$$P + 6100 = 10100$$
$$P = 10100 - 6100$$
$$\boxed{P = 4000}$$

Conclusion:

Monthly salary of P = 4000

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part (c)

Given Data:

No of times coins tossed n = 500 times.

(i) No of times 2 heads appear(E) = 105 times.

(ii) No of times 1 head appear(E) = 275 times

(iii) No of times no head appear(E) = 120 times

To find:

Probability of each event to occur = ?

Solution:

(i) Probability of 2 heads = $\frac{\text{No of favorable outcomes of 2 heads (E)}}{\text{Total no of possible outcome (n)}}$

$$= \frac{105}{500}$$
$$= \boxed{\frac{21}{100} \text{ or } 0.21}$$

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(ii) probability of 1 head = no of times 1 head appear (E)
Total no of possible outcome (n)

$= \frac{\cancel{55}\ 11}{\cancel{500}\ \cancel{100}\ 50} = \frac{275}{500}$

$= \boxed{\frac{11}{50} \text{ or } 0.55}$

(iii) Probability of no head = no of times no head appear (E)
Total no of possible outcome (n)

$= \frac{\cancel{24}\ 12\ \cancel{6}}{\cancel{500}\ \cancel{100}\ \cancel{50}\ 25} = \frac{120}{500}$

$= \boxed{\frac{6}{25} \text{ or } 0.24}$

Conclusion:

The probability of all events are 0.21, 0.55 and 0.24 respectively. The sum of all three events probability 0.21 + 0.55 + 0.24 is equal to 1.

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part (d)

Given Data:

Jamie's Age = x

Jamie's Dad age = 4x

After 14 years = Jamie's dad will be

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twice the age of Jamie.

To find:

Sum of Jamie's age now and Dad age now=?

Solution:

Initially Jamie = Jamie's Dad

$x = 4x$

After 14 years

$2(x + 14) = 4x + 14$

So:

$2x + 28 = 4x + 14$

$2x - 4x = 14 - 28$

$-2x = -14$

$\frac{-2x}{-2} = \frac{-14}{-2}$

$x = 7$

So Now

→ Jamie's Age $x = 7$

→ Jamie's Dad Age = $4x = 4 \times 7 = 28$

Sum of Jamie's Age Now and Dad Age Now = $7 + 28 = 35$

Conclusion:

Sum of Jamie's age and his dad age now is 35.