

LAKSHYA JEE



LAKSHYA KO HAR HAAL ME PAANA HAI



SOLUTION

By
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Equivalent mass :-

Amount of substance which will react or produce or displace

1 g of Hydrogen

or 8 g of oxygen or 35.5 g of Chlorine



28g of
N₂

6g of
H₂

34g of
NH₃

6g of H_2 react with $N_2 = 28g$

1g of H_2 react with $N_2 = \frac{28}{6} = \frac{14}{3} g$

Eq. mass of N_2 in this orⁿ = $\frac{14}{3} g$

6g of H_2 produces $NH_3 = 34g$

1g of H_2 produces $NH_3 = \frac{34}{6} = \frac{17}{3}g$

Eq. mass of NH_3 in this orⁿ = $\frac{17}{3} = 5.67g$



16g of
CH₄

64g
of O₂

44g
of CO₂

36g
of H₂O ✓

64g of O_2 reacts with $CH_4 = 16g$

8g of O_2 reacts with $CH_4 = \frac{16^2}{64} \times 8$

Eq. mass of CH_4 in this $o^{\circ} = 2g$

64g of O_2 produces $CO_2 = 44g$

8g of O_2 produces $CO_2 = \frac{44}{64} \times 8$

Eq. mass of CO_2 in this air = $5.5g$

64g of O_2 produces $H_2O = 36g$

8g " " " " " " = $\frac{36}{64} \times 8 = 4.5g$

Eq. mass of H_2O in this $n^{\circ} = 4.5g$

$$\text{Eq. mass of oxygen} = \frac{16}{2} = 8g$$



$$\text{Eq. mass} = \frac{G \cdot M \cdot M}{n\text{-factor}}$$

$$\text{Eq. mass of } \underline{\text{CO}_3}^{2-} = \frac{\text{G.M.M.}}{n_{\text{factor}}} = \frac{60}{2} = 30\text{g}$$

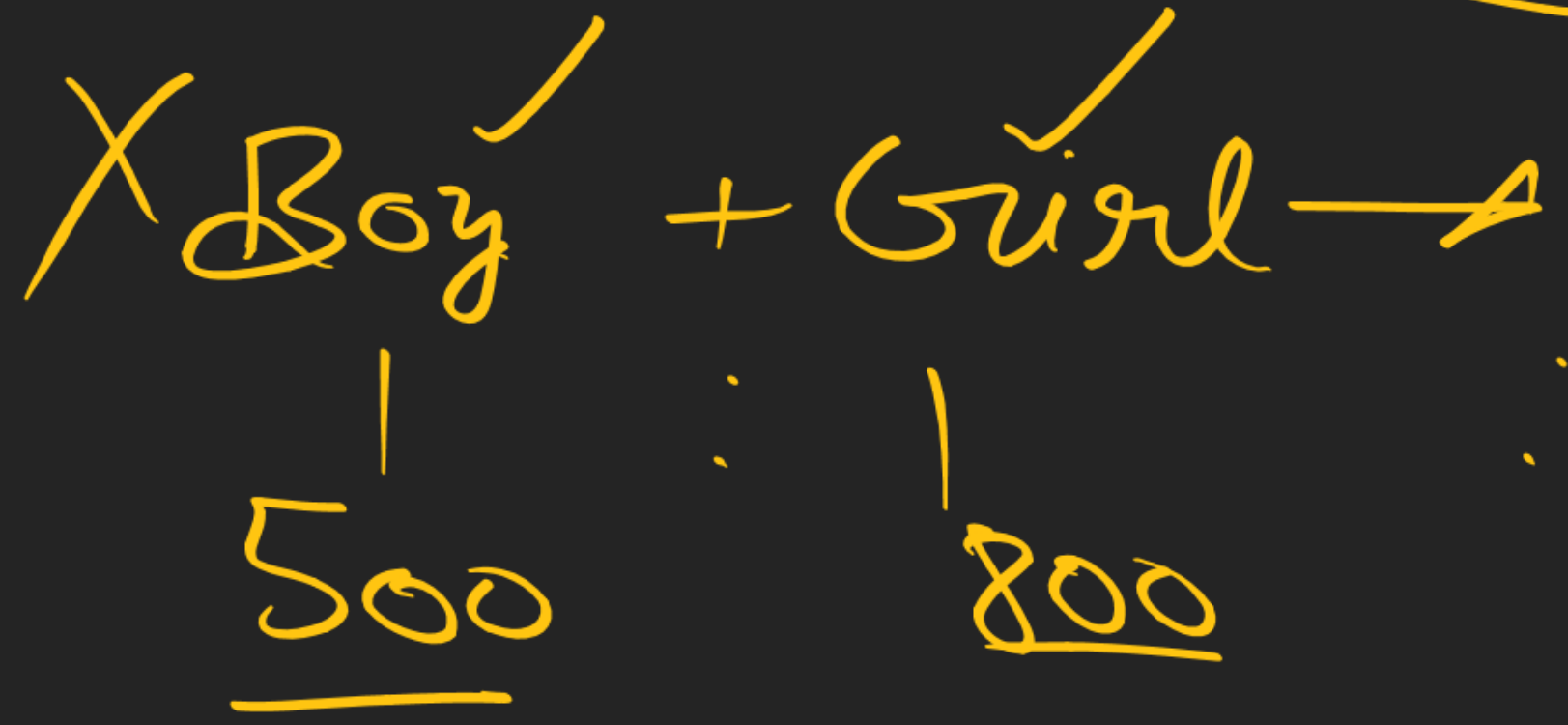
Law of Equivalence :-



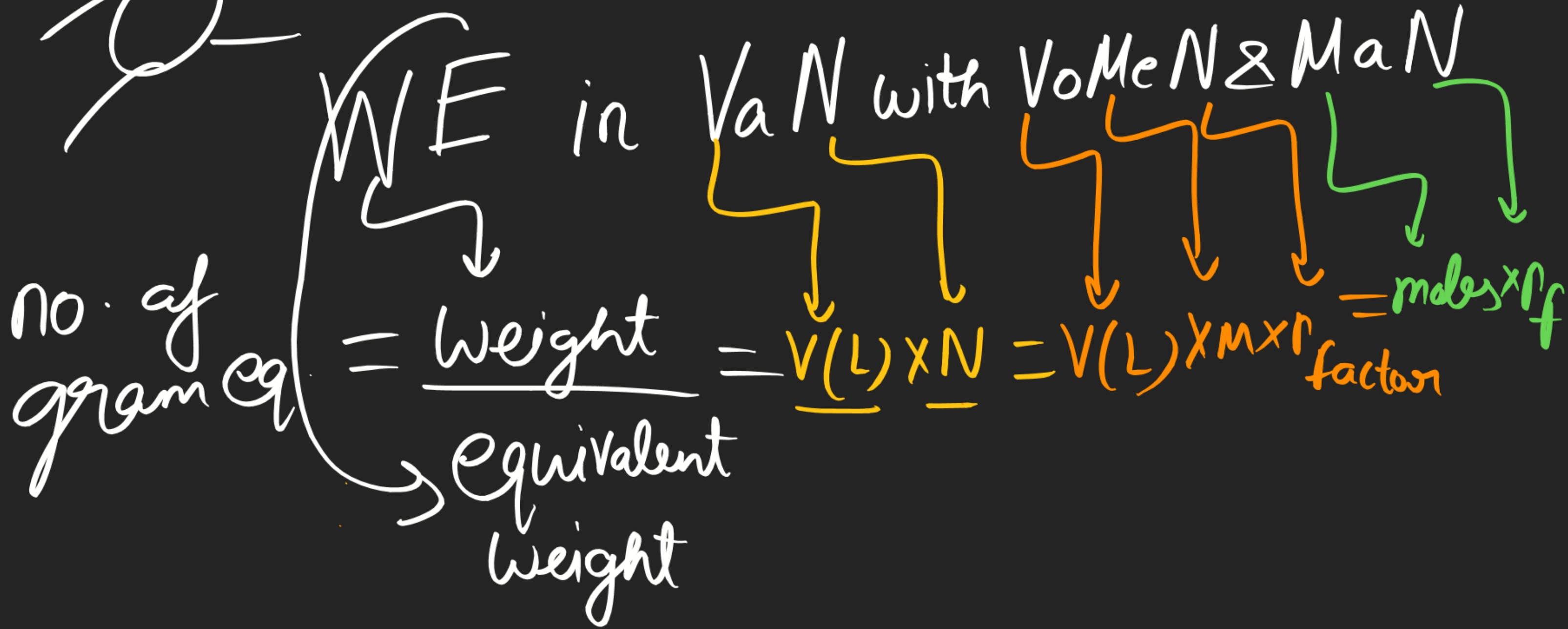
gram eq. of each reactant reacted
= gram eq. of each product
produced.

NGO	
Boys	Girls
500 ✓	800 ✓

Limiting Reagent
 ↓
 g. eq. least.



✓
 Marriage
 |
500



$$\frac{N}{V(L)} = \text{no. of gram eq}$$

$$\text{gram eq} = \frac{\text{mass}}{\text{Eq mass}} = \left(\frac{\text{mass}}{G \cdot M \cdot M} \right) \times \rho \text{ factor}$$

Q find N of resulting solⁿ if
500ml of 1M H_2SO_4 reacts with
250ml of 1N KOH & also find
nature of resulting solution?

Ans gram eq. of acid = $\frac{500}{1000} \times 1 \times 2 = 1$

X gram eq. of base = $\frac{250}{1000} \times 1 = 0.25$

g. eq. of acid left = $1 - 0.25 = 0.75$

Resulting solution is Acidic in nature.

N of resulting acidic solution

$$= \frac{0.75 \times 1000}{750 \times 100} = 1 \text{ N}$$

If nature of solutions are different
then on mixing = $\left| \frac{N_1 V_1 - N_2 V_2}{\text{Total Volume}} \right|$

$$\text{Total Volume} = V_1 + V_2$$

$$N_1 = N \text{ of acids}$$

$$V_1 = V \text{ of acid}$$

$$N_2 = N \text{ of base}$$

$$V_2 = V \text{ of base}$$

N of resulting solution if nature
of solution is same.

↓

$$N \text{ of resulting sol}^n = \frac{N_1 V_1 + N_2 V_2 + \dots}{V_1 + V_2}$$

QUESTION :

Calculate the normality of the solution obtained by mixing

- (i) 100 cc of 0.2 N H₂SO₄ with 50 cc of 0.1 N HCl.
- (ii) 100 cc of 0.1 N H₂SO₄ with 100 cc of 0.2 N NaOH.
- (iii) 100 cc of 0.1 M H₂SO₄ with 100 cc of 0.1 M NaOH.

$$CC = \text{cm}^3 = 1 \text{ ml}$$



$$(i) \quad g \cdot eq \text{ of Ist acid} = \frac{100 \times 0.2}{10} = 0.02$$

$$g \cdot eq \text{ of IInd acid} (N_2 V_2) = \frac{50 \times 0.1}{20} = \frac{1}{200}$$
$$= 0.005$$

$$N \text{ of resulting sol}^n = \frac{0.025}{0.15}$$

$$(ii) \text{ g. eq of acid} = \frac{100^{\checkmark}}{1000} \times 0.1 = 0.01$$

$$\text{g. eq of base} = \frac{100^{\checkmark}}{1000} \times 0.2 = 0.02$$

$$N \text{ of resulting solution} = \frac{|0.01 - 0.02|}{0.2} = \frac{0.01}{0.2}$$

$$N \text{ of resulting solution} = \frac{10}{200} = 0.05 N$$

QUESTION:

The volume (in mL) of 0.1 N NaOH required to neutralise 10 mL of 0.1 N phosphonic acid is

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Ans

$\text{g-eq. of base} = \text{g-eq. of Acid.}$

$$\frac{V}{1000} \times \cancel{0.1} = \frac{10}{1000} \times \cancel{0.1}$$

$$V(\text{ml}) = 10 \text{ ml}$$

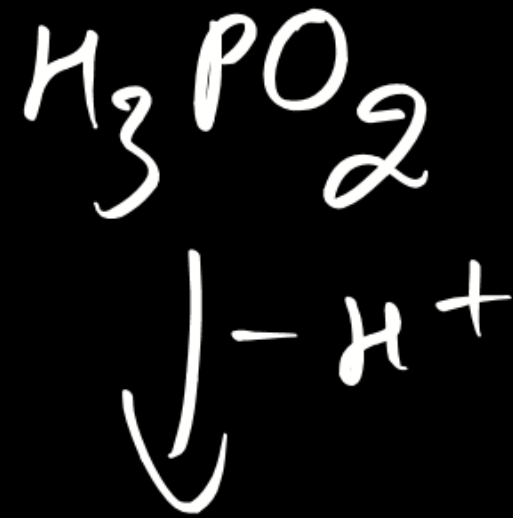
Phosphonic acid



QUESTION :

It 0.1 mole H_3PO_x is completely neutralised by 5.6 g KOH then select the true statement.

- (a) $x = 3$ and given acid is dibasic
- (b) $x = 4$ and given acid has no P-H linkage
- (c) $x = 2$ and given acid does not form acid salt
- (d) All of these



gram eq. of $H_3PO_4 = \underline{\text{gram eq. of KOH}}$

$$\text{moles} \times n_f = \frac{\text{mass of KOH}}{\text{Eq. mass of KOH}}$$

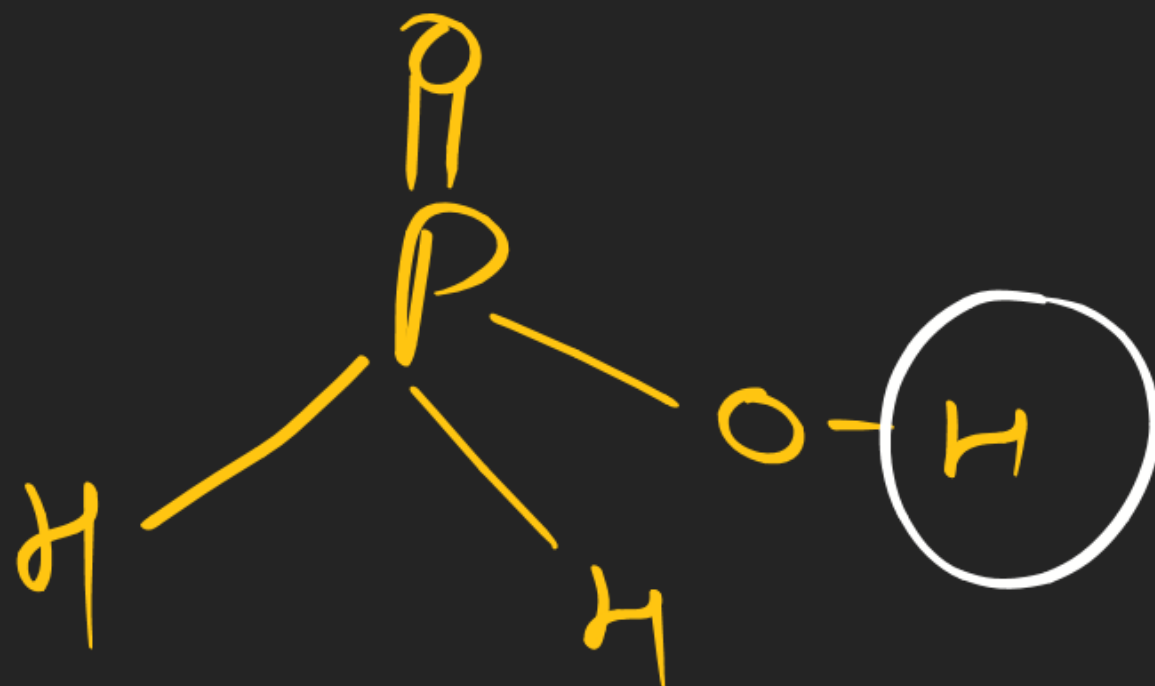
$$0.1 \times n_f = \frac{5.6}{56_{10}}$$

$$n_f = 1$$

$$\text{Eq. mass of KOH} = \frac{56}{1}$$

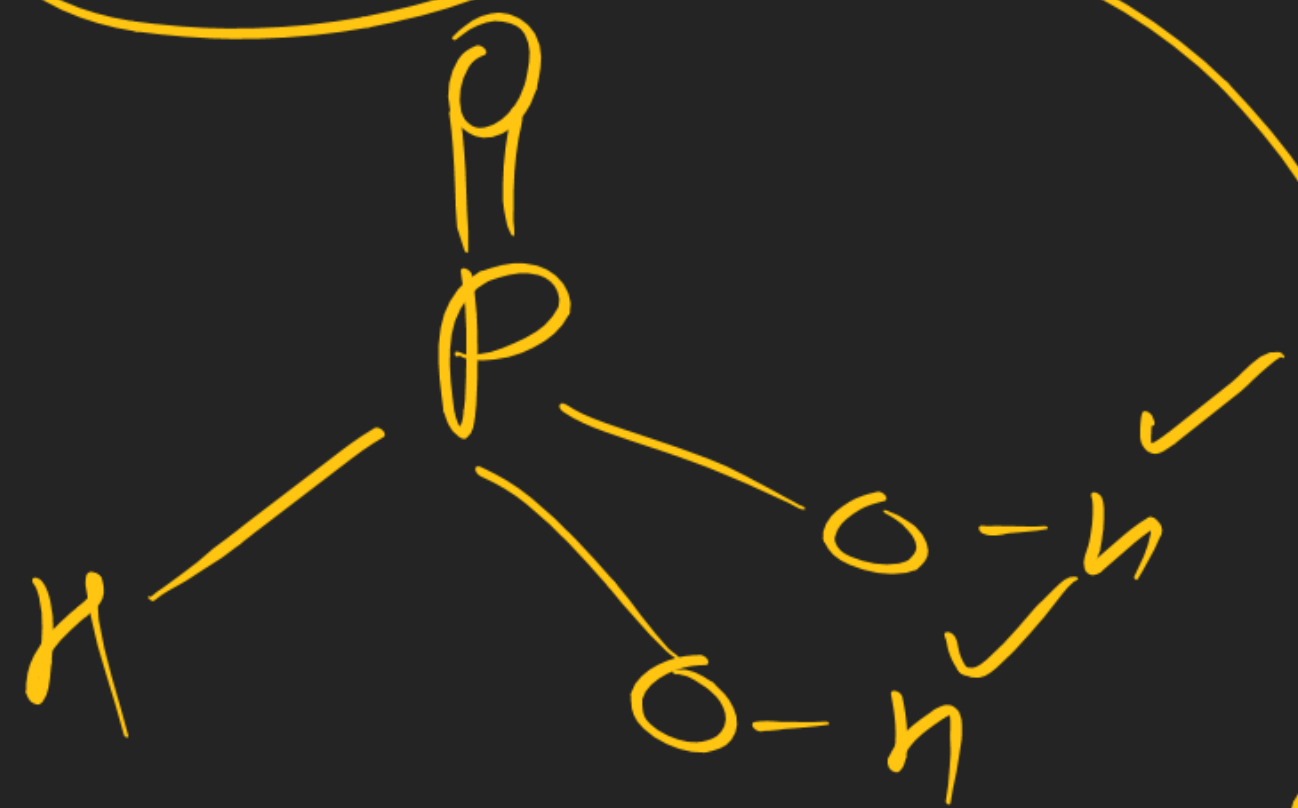


$$x=2$$





or



Can form Acid salt.

Thank You Lakshyians