YAKEEN NEET 2.0

2026

Redox Reaction

Physical Chemistry | Lecture -05

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Topics to be covered

1. Revision of Last Class
2. Balancing of Redox Reactions
3. Range of Oxidation State, Redox Titrations
4. MEDICS Test no 5
5. Magarmach Practice Questions (MPQ) & Home work from modules

Rules to Attend Class

1. Always sit in a peaceful environment with headphone and be ready with your copy and pen.
2. Never ever attend a class from in between or don't join a live class in the middle of the chapter.
3. Make sure to revise the last class before attending the next class & always complete your Magarmach Practice Questions.
4. Never ever engage in chat whether live or recorded on the topic which is not being discussed in current class as by doing so u can be blocked by the admin team or your subscription can be cancelled.

Rules to Attend Class

5. Try to make maximum notes during the class if something is left then u can use the notes pdf after the class to complete the remaining class.
6. Always ask your doubts in doubt section to get answer from faculty. Before asking any doubt please check whether same doubt has been asked by someone or not.


There is one big flaw in your Preparation that's name is Backlog ? What do we say to Backlog ?
NOT TODAY !!!

MEDICS test no :5

MEDICS

Mastery
Checks your grasp over NEET-level concepts

Evaluation
Judging both knowledge and test-smartness

Decision Making
Testing your speed + accuracy under pressure

Intuition
Some answers need gut + logic – can you spot the trick?

Concepts
It's all about strong basics – no shortcuts here

Strategy
The MEDICS test – built for those who heal, hustle, and hope.

QUESTION

1 mole of BaF_2 is mixed with 2 moles of H_2SO_4. Filtrate required _____moles of NaOH to neutralise acid.

(A) 2 moles of KOH

(B) 4 moles of KOH

(C) 3 moles of KOH

(D) 1 mole of KOH

$BaF_2 + H_2SO_4 \rightarrow BaSO_4\downarrow + 2HF$

white p.p.t

g.eq. $1 \times 2 = 2$ | $2 \times 2 = 4$

g.eq left $4 - 2 = 2$

2 g eq p.p.t | 2 g eq

KOH g eq. | 2 g eq | 2 g eq

KOH moles. | 2 moles | 2 moles

QUESTION

The equivalent mass of an element is 4. Its chloride has a vapour density 59.25. Thus, valency of the element is

$n_f = ?$

A 1

B 2

C 3

D 4

$E = 4$

G.M.M. of element Chloride $= 2 \times 59.25\ g$

$= 118.5\ g$

$$\text{Eq. Mass} = \frac{118.5}{n_f} = 4 + 35.5$$

$$n_f = \frac{118.5}{39.5} = 3$$

QUESTION

M^{2+}

Equivalent mass of a divalent cation is E. Thus, molar mass of its oxide and chloride are respectively

Eq. mass = E

(A) (E + 8)(E + 35.5)

(B) (E + 16) (E + 71)

(C) 2(E + 8), 2(E + 35.5)

(D) (2E + 8) (2E + 35.5)

$\text{Eq. mass of oxide} = \frac{M}{n_f}$

$(E + 8) = \frac{M}{2}$

$M = 2(E + 8)$

$M = 2(E + 35.5)$

QUESTION

Number of moles of dibasic acid in 0.10 dm^3 of the aqueous solution to give decinormal solution is

A 0.10 mol

B 0.01 mol

C 0.005 mol

D 0.50 mol

$n_f = 2$ $\quad V(L) = 0.1\,L$

moles = ? $\quad N = \frac{1}{10}N = 0.1N$

$$N = \frac{\text{g eq.}}{V(L)}$$

$$0.1 = \frac{\text{moles} \times 2}{0.1}$$

$$\text{moles} = \frac{1}{200} = 0.5 \times 10^{-2}$$

QUESTION

A divalent metal cation has equivalent weight 12. The molecular weight of its oxide is

$n_f = 2$

(A) 16

$E_{metal} = 12$

(B) 32

$E_{oxygen} = 8$

(C) 40

$E_{metal\ oxide} = 12 + 8 = 20 = \frac{G.M.M}{n_f}$

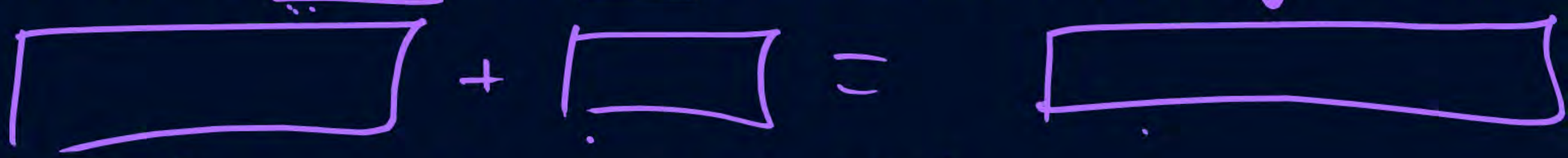
(D) 52

$G.M.M. = 40g$

QUESTION

What the ratio of volume of 12.0 N and 3.0 N HCl in a mixture to give 1.00 L of 6.00 N HCl.

$V_1 = xL = 0.33L$ $V_2 = (1-x)L = \frac{2}{3} = 0.66L$



$x \times 12 + (1-x) \times 3 = 1 \times 6$

$12x + 3 - 3x = 6$

$9x = 3$

$x = \frac{3}{9} = \frac{1}{3}$

A 1 : 1

B 2 : 1

C 1 : 2

D 1 : 3

QUESTION

Mixture of x mL of 2N HCl, 50 mL of 4 N HNO_3 and 62.5 mL of 2M H_2SO_4 is diluted to 1L. 50 mL of this solution required 25 mL of 0.5 M Na_2CO_3 solution for complete reaction. Thus, x is

(A) 25 mL

(B) 40 mL

(C) 60 mL

(D) 100 mL

Total milli g eq of $H^+ = 2x + 200 + 62.5 \times 2 \times 2$

$= 2x + 450$

$N_{H^+} = \frac{450 + 2x}{1000}$

milli g-eq of H^+ in 50ml = milli g-eq of Na_2CO_3

$50 \times \left(\frac{450 + 2x}{1000}\right) = 25 \times 0.5 \times 2$

$450 + 2x = 500 \Rightarrow 2x = 50$

$x = 25$

QUESTION

Normality of 0.3 M H_3PO_3 solution based on the following reaction is

$$H_3PO_3 + 2OH^- \longrightarrow HPO_3^{2-} + 2H_2O$$

(A) 0.3 N

(B) 0.6 N

(C) 0.1 M

(D) 0.15 N

$N = M \times n_f$

$= 0.3 \times 2$

$= 0.6\ N$

QUESTION

100 mL of 10% NaOH (W/V) is added to 100 mL of 10% HCl (w/V), thus resultant mixture is

A. 0.12 M in terms of H^+

B. 0.12 M in terms of OH^-

C. 0.048 M in terms of H^+

D. 0.192 M in terms of H^+

Revision of Last class

Balancing of Redox Reactions

Q $Cl_2^0 + OH^- \longrightarrow Cl^- + ClO_3^{+5-} + H_2O$

R

$10\,Cl_2^0 + 2\,Cl_2^0 + 24OH^- \longrightarrow 20\,Cl^{-1} + 4\,ClO_3^{+5-} + 12H_2O$

$+12H_2O$

25 H

13 ox.

24 Hyd.

$12\,Cl_2 + 24OH^- \longrightarrow 20\,Cl^- + 4\,ClO_3^- + 12H_2O$

Red. Ox.

$4P_4^{0} + 12P_4^{0} + 48NaOH \rightarrow 16P^{-3}H_3 + 48Na\overset{+1}{H_2}PO_2$

$+ 48H_2O$

144 Hz

96 ∞ J/C

$48 + 96 = 144$

$\overset{1}{16}P_4 + \overset{3}{48}NaOH + \overset{3}{48}H_2O \rightarrow \overset{1}{16}PH_3 + \overset{3}{48}NaH_2PO_2$

Q1 $HgO_2 \longrightarrow HgO + \frac{1}{2} O_2$

Q2 $Zn + 2HCl \longrightarrow ZnCl_2 + H_2$

$$a\ 2\overset{+7}{Mn}O_4^- + b\,I^- + cH_2O \longrightarrow x\overset{0}{I_2} + y\overset{+4}{Mn}O_2 + zOH^-$$

$b = 3I$

$x = \frac{3}{2}I_2$ $\quad y = 2$

$Z = ?$

8 ox. +

$8 + C$

$2C = Z$

$C = \frac{Z}{2}$

$8 + C = 4 + Z$

$Z - C = 4$

$Z - \frac{Z}{2} = 4$

$\frac{2Z - Z}{2} = 4$

$Z = 8$

$4MnO_4^- + 6I^- + 8H_2O \Rightarrow 3I_2 + 4MnO_2 + 16OH^-$

Q. $2IO_3^- + xI^- + 12H^+ \rightarrow 6I_2 + 6H_2O$

$2 + x = 12$

$x = 10$

Q.

$a\,Cl_2 + b\,OH^- \rightarrow c\,ClO^- + d\,Cl^- + e\,H_2O$

$2a = c + d$

$H_2O + Cl_2 + 2OH^- \rightarrow ClO^- + Cl^- + H_2O + H_2O$

Basic

$$2MnO_4^- + Br^- \longrightarrow 2MnO_2 + BrO_3^-$$

$$+ H_2O \rightarrow 2OH^-$$

$$1IO_3^- + \overset{5}{a}I^- + bH^+ \longrightarrow cH_2O + \overset{3I_2}{dI_2}$$

$6H^+$

$3H_2O$

$a+1 = 2d$

$a = 2d-1$

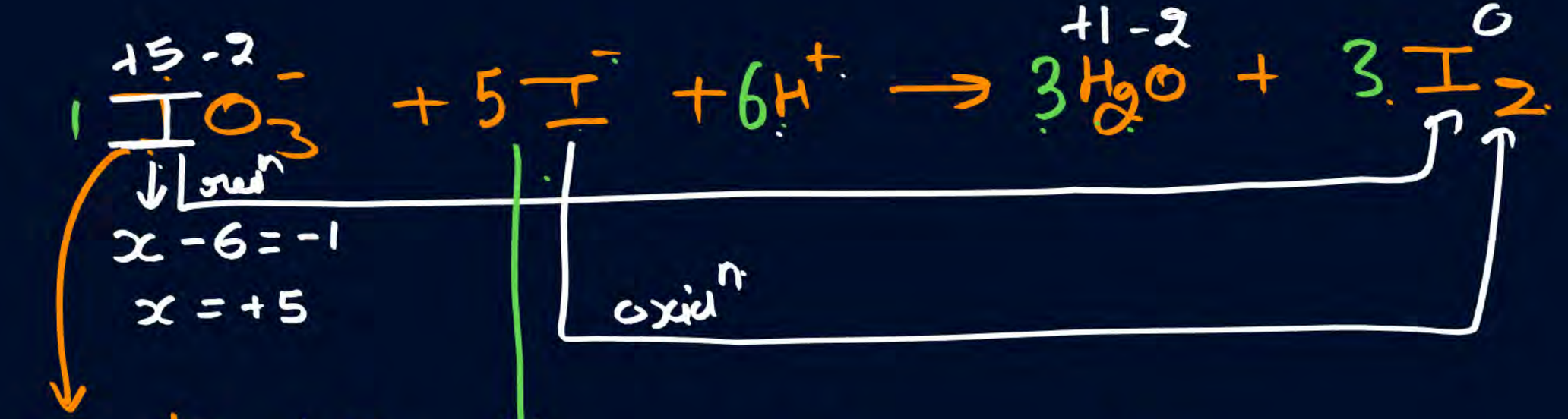
$c = 3$

$$\overset{+5}{1}IO_3^- + 5I^- + 6H^+ \longrightarrow 3H_2O + 3\overset{0}{I_2}$$

$n_f = 1|5-0| = 5$

$n_f = 1|-1-0| = 1$

Q.


+5 -2
IO_3^-
I^-
$+6H^+$
+1 -2
$3HgO$
$3.I_2^0$
reduction
oxidation
$x - 6 = -1$
$x = +5$
$n_f = 1 \left| 5 - 0 \right| = 5$
$n_f = 1 \left| -1 - 0 \right| = 1$
3 ox.
1 Hyd.
1 ox.
6 Hyd.

Q

$$\overset{+6\ -2}{2Cr_2O_7^{2-}} + 6Sn^{2+} + 28H^+ \longrightarrow 6Sn^{4+} + 4Cr^{3+} + \overset{+1\ -2}{14H_2O}$$

red^n

oxid^n

$n_f = 2|6 \cdot 3| = 6$

$n_f = 1|2 \cdot 4| = 2$

$$Cr_2O_7^{2-} + 3Sn^{2+} + 14H^+ \longrightarrow 3Sn^{4+} + 2Cr^{3+} + 7H_2O$$

Q. $12OH^- + 6\overset{+3}{Cr}(\overset{-2+1}{OH})_3 + 3\overset{+5\ -2}{IO_3^-} \rightarrow 3I^- + 6\overset{+6\ -2}{CrO_4^{2-}} + 15H_2O$

$n_f = 1|3-6| = 3$

$n_f = 1|5-(-1)| = 6$

27 ox.

18 Hyd.

24 ox.

6 Hyd.

$4OH^- + 2Cr(OH)_3 + IO_3^- \rightarrow I^- + 2CrO_4^{2-} + 5H_2O$

Range of Oxidation State

#MIT

① Range of O.S. $\Rightarrow$ 13th to 17th grp.
& 3rd period onwards.

② Range of O.S = (n-8) to n

n = no. of Valence e^-

grp.	13	14	15	16	17
Val. e^-	3	4	5	6	7

Q Cl ↓ range of O.S.

grp. 17

Val. e^- = 7

Ans Range of O.S. = (7-8) to 7

= -1 to +7

Q S range of O.S

n = 6

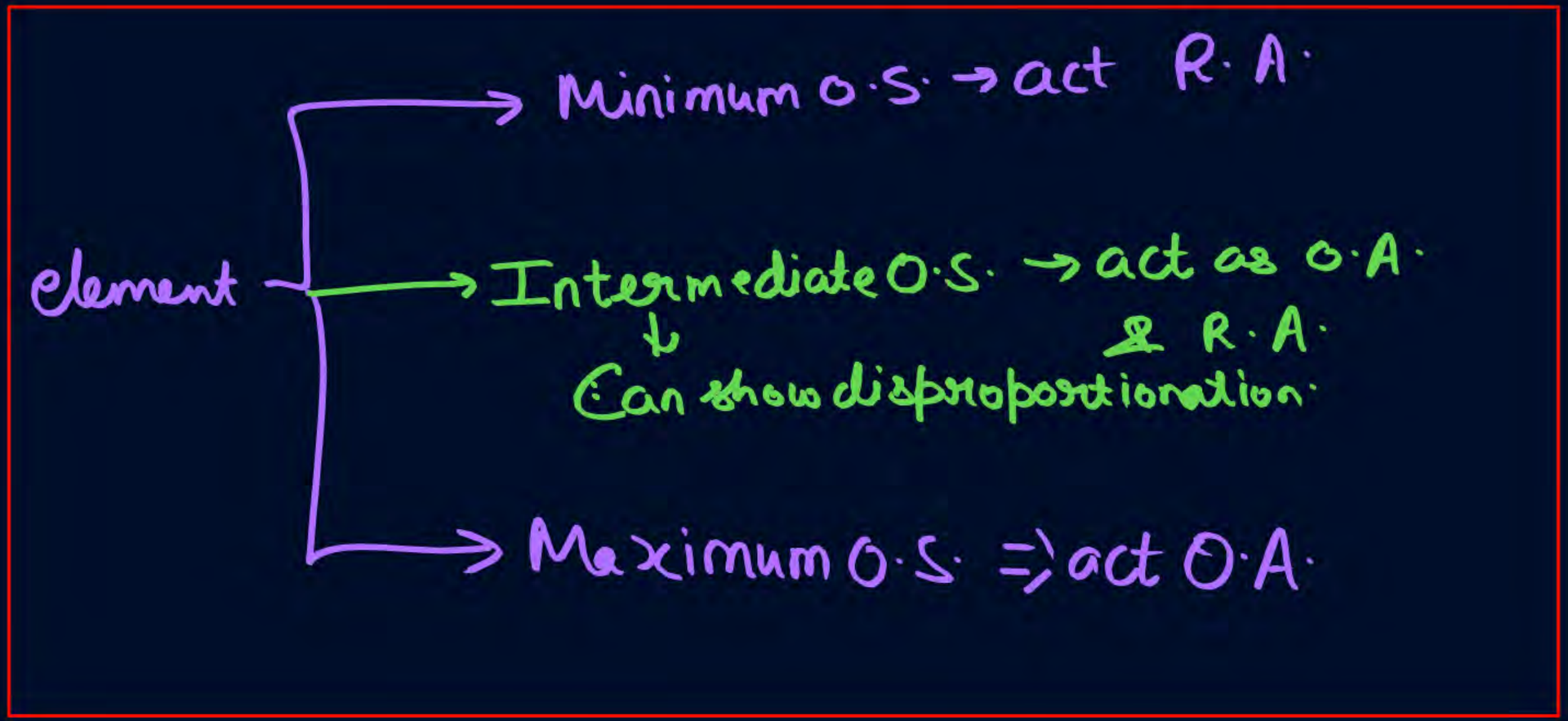
Ans

range of O.S. = (n-8) to n

= (6-8) to 6

= -2 to +6

#
IIT


Minimum O.S. → act R.A.
element
Intermediate O.S. → act as O.A.
&
R.A.
∴ Can show disproportionation.
Maximum O.S. ⇒ act O.A.

QUESTION – (AIEEE 2010)

The oxide, which cannot act as a reducing agent is:

max. 0.5.

(A) CO_2 (+4) — 4

(B) ClO_2 (+4) — 7

(C) NO_2 (+4) — 5

(D) SO_2 (+4) — 6

SO_2 (S^{+4}) Can act both as R.A. & O.A. → True.

H_2SO_4 (S^{+6}) Can act as Oxid. agent. → True.

Q. In which one sets all species show disproportionation?

	Max. O.S.
Cr	+6
Mn	+7

✗ (a) ClO_4^-, MnO_4^-, ClO_2^-, F_2

✗ (b) MnO_4^-, ClO_2^-, Cl_2 & Mn^{3+}

✗ (c) $Cr_2O_7^{2-}$, MnO_4^-, ClO_2^- & I_2.

✗ (d) ClO_2, F_2, MnO_4^- & $Cr_2O_7^{2-}$

Redox Titrations

- One of the chemicals is oxidized and other is reduced during titration.

① Law of equivalence
↓
eq. mass
g. eq.
N, M
→ Revise

↓
Some basic Concepts of Chemistry

Home work from modules

Do all questions of Balancing of Redox reactions.

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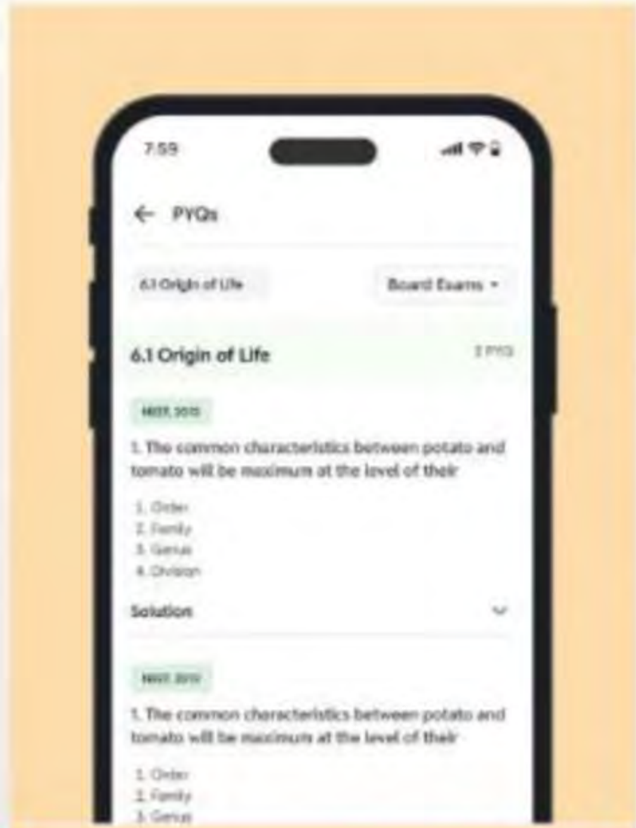
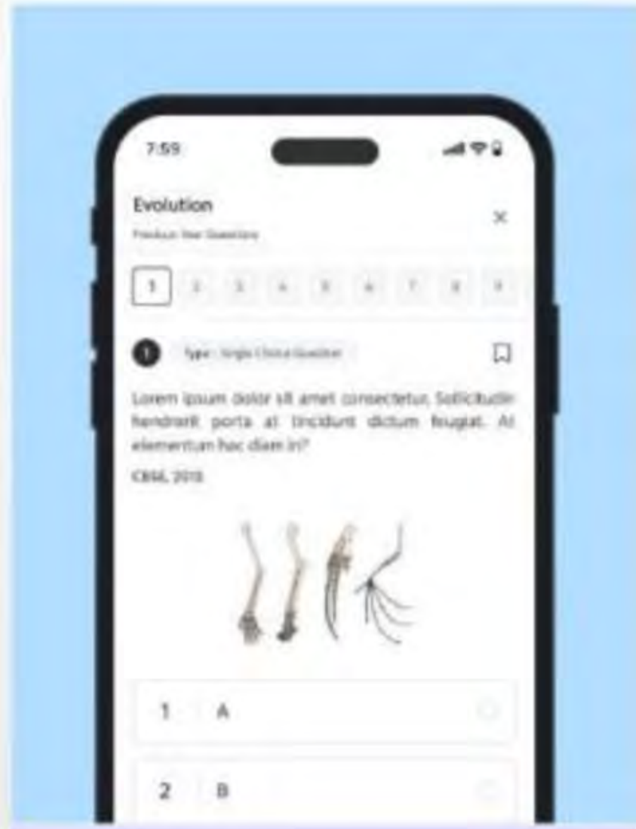


Topic-wise

Previous Year Questions



10,000+

Practice Questions to Ace Exams

THANK YOU