

Answer Booklet

Indian National Chemistry Olympiad 2025 Theory (3 hours)

Total 109 marks

Time- 3 hours

Question No	1	2	3	4	5	Total
Marks	23	25	21	24	16	109
Marks Obtained						
Signature of Examiner						

Date: February 01, 2025

Do not write anything above this line

Instructions for students

Please write your roll number in the space provided in the box.

Roll No.

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Exam Centre

- On each page, do not write any part of your answer outside the designated rectangular frame. Any writing outside the frame will not be evaluated.
- Use only black or blue pen to write the answers in this answer booklet. Answers written in pencil will not be graded.
- You must show the main steps in the calculations and state the necessary assumptions made while solving the tasks.
- For multiple choice questions, mark **X** in the correct box.
- Page 16 can be used for answering any question requiring additional space for a solution. Mark the appropriate question number.
- Do not leave the examination room until you are directed to do so.
- This answer booklet must be returned to the invigilator.
- Page 17 and 18 can be used for doing rough work.

Signature of student

Signature of invigilator

Problem 1

23 marks

The golden alloy

1.1

	Yes	No
Cu & Ag		
Cr & K		
Cu & Al		
Ag & Al		

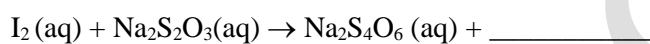
1.2

300 °C _____

750 °C _____

1.3 i)

ii)



iii)

iv)

a) ☐

b)

☐

c)

☐

v)

vi)

vii)

a)

b)

c)

d)

1.4 i)

ii)

iii)

1.5

a)

b)

c)

d)

e)

1.6

Reaction	Metal ion(s) and their form in supernatant	Composition of precipitate
Ni-brass solution + excess NaOH (aq.)		
Ni-brass solution + excess NH_3 (aq.) till pH is 9.5		

1.7 i)

Site A

Site B

ii)

Problem 2

25 marks

Hydrogen Peroxide- a Versatile Reagent

2.1

i)

ii)

2.2

2.3

i)

ii)

2.4

i)

ii)

2.5 i)

ii)

HBCSE

2.6 i)



ii)

iii)

iv)

	reduces consumption of	enhances yield of	decreases contamination in	increases contamination in
I. When added in the chosen step _____,				
II. When added in another step _____,				

2.7 a)

☐

It prevents formation of _____ as waste product.

b)

☐

It enhances formation of _____ as a useful by-product.

c)

☐

It reduces consumption of _____ as input chemicals.

Problem 3**21 Marks****Structure Elucidation of a Drug**

3.1

a)

☐

b)

☐

c)

☐

d)

☐

3.2 i)

D

E

ii)

a)

☐

b)

☐

c)

☐

d)

☐

e)

☐

f)

☐

iii)

F	G	B

iv)

 $pK_a =$

1.8

7.9

10.5

v)

Team

Statement(s)

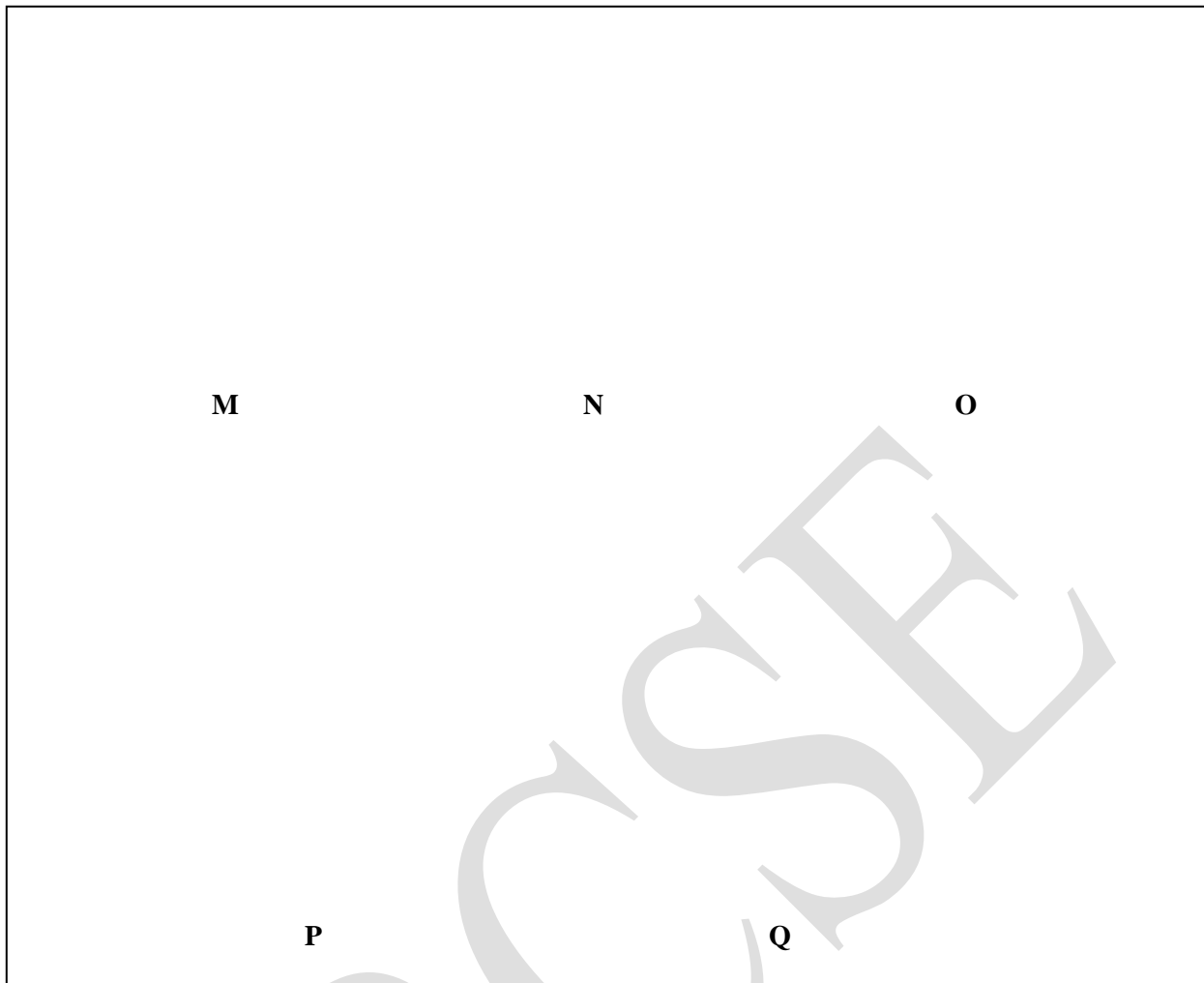
3.3

	C

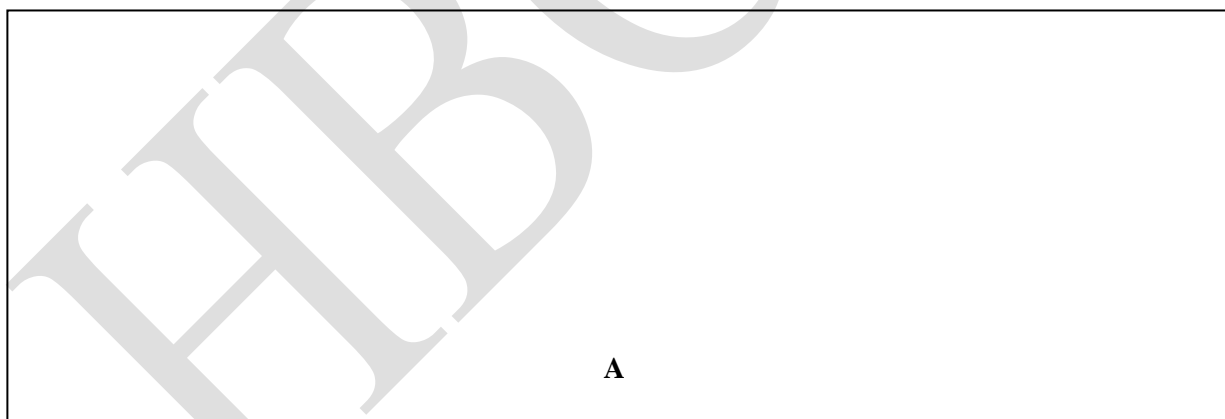
3.4 i)

H	I
K	L

ii)



iii)



iv)



Problem 4

24 Marks

An acid from sugar

4.1

4.2

4.3

4.4

pH 7.3

pH 12.0

HB CSE

a)

11

b)

c)

7

d)

11

a)

b)

□

c)

d)

7

e)

11

4.9

E F

4.10

a)

☐

b)

☐

c)

☐

d)

☐

4.11

H I

4.12

J

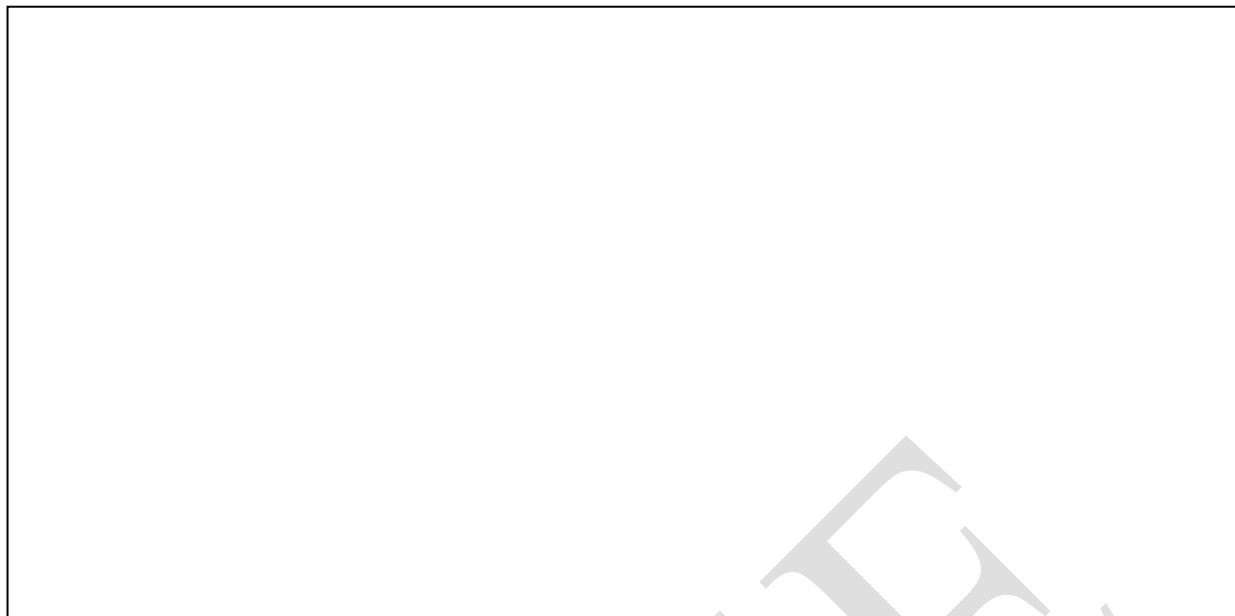
K

L

A + $\text{Ce}(\text{NH}_4)_4(\text{SO}_4)_4 \longrightarrow$ **E** + _____

16 marks

5.2 i)



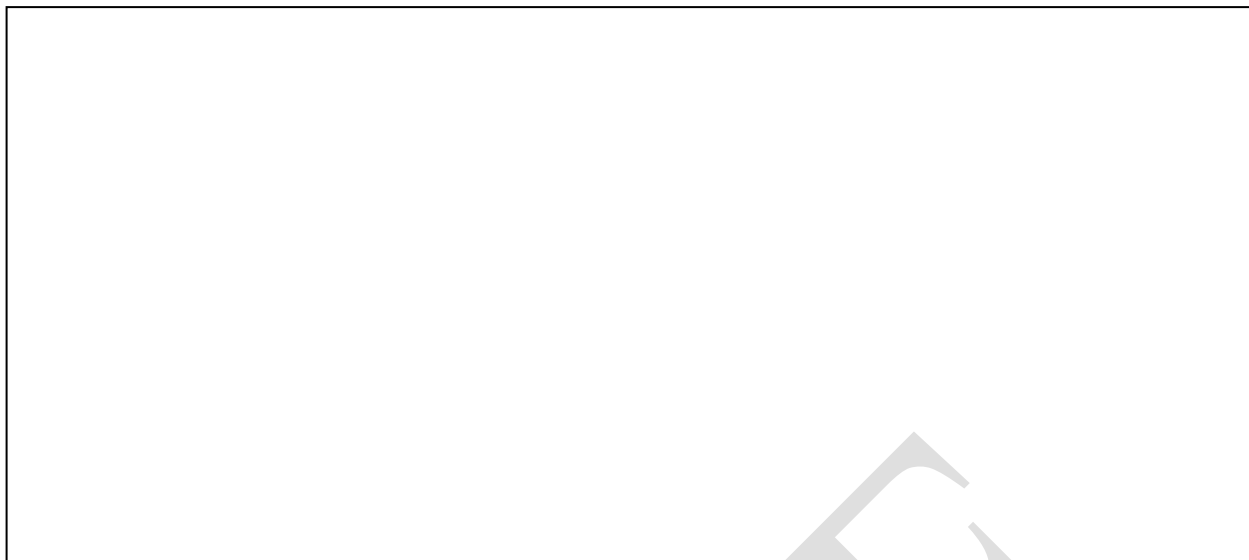
ii)



5.3



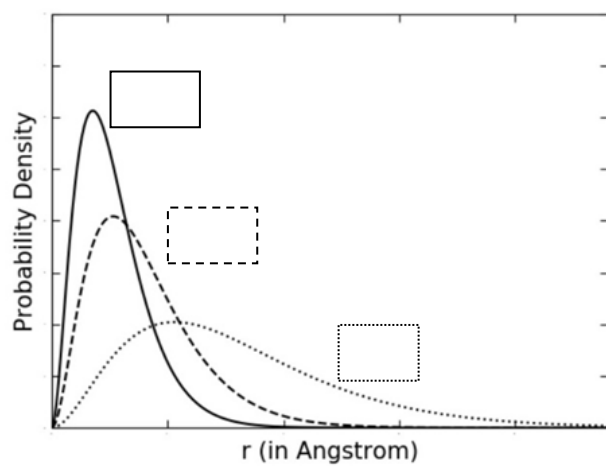
5.4



5.5

a) b) c) d)

5.6



5.7



5.8

ADDITIONAL SPACE FOR ANSWERS

HBCSE

ROUGH WORK

HBCSE

ROUGH WORK

HBCSE