

प्रश्न मेला - V. K. Jaiswal Inorganic Chemistry

Periodic Table

→ Part - I



Kapil Rana (IIT, KGP)

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“VKJ Series”

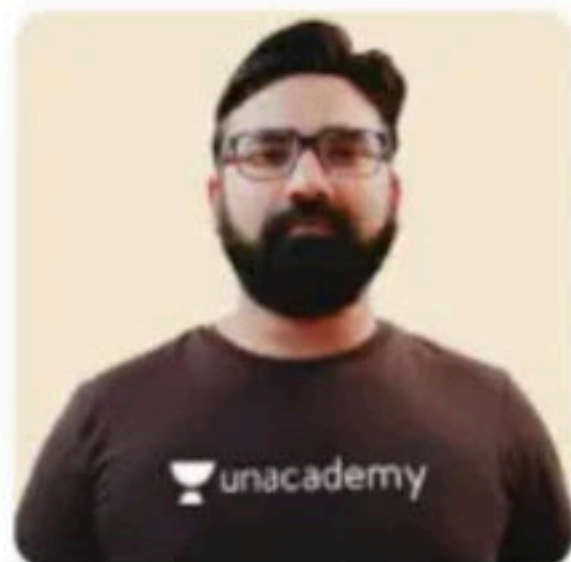
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Kapil Rana (IIT KGP)

VKT (Balaji Publication) → IOC (11th + 12th)

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Kapil Rana

#15 Educator in IIT JEE

Studied at IIT Kharagpur | Specialisation in inorganic Chemistry | Kota Faculty | | Mentor of top JEE rankers

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Batches



HINDI

Expert Batch for JEE Main & Advanced for January 2021

Started on Oct 1

Kapil Rana and 3 more



HINDI

EXCEL for Droppers JEE Main and Advanced 2021

Started on Sep 21

Kapil Rana and 4 more



HINDI

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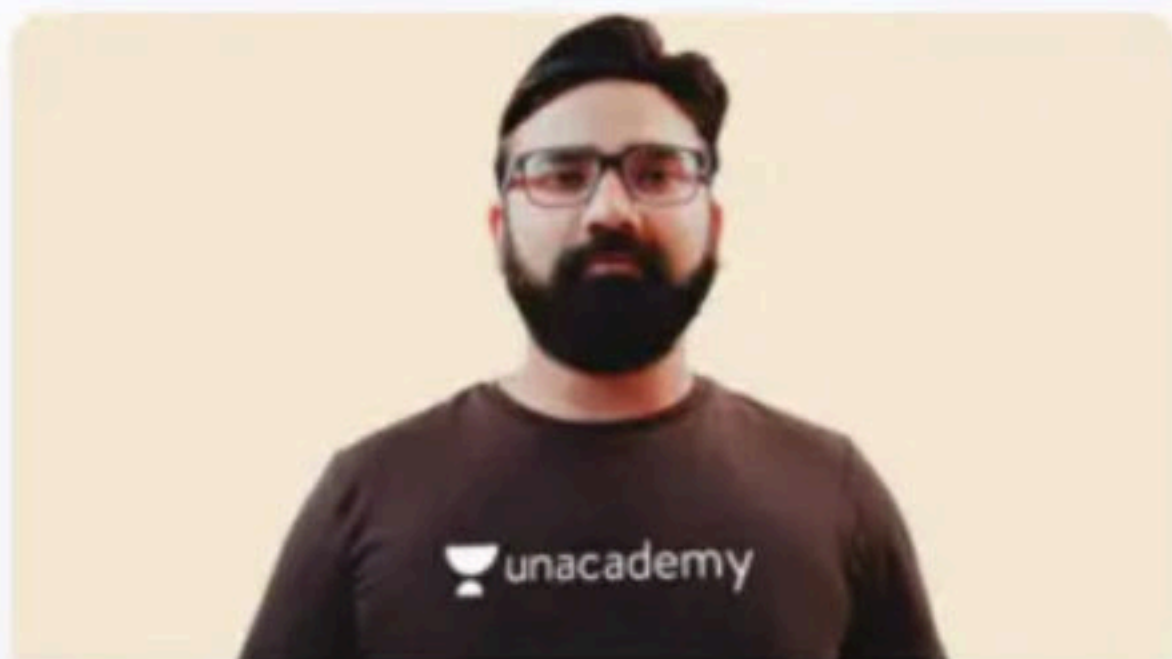
Started on Sep 11

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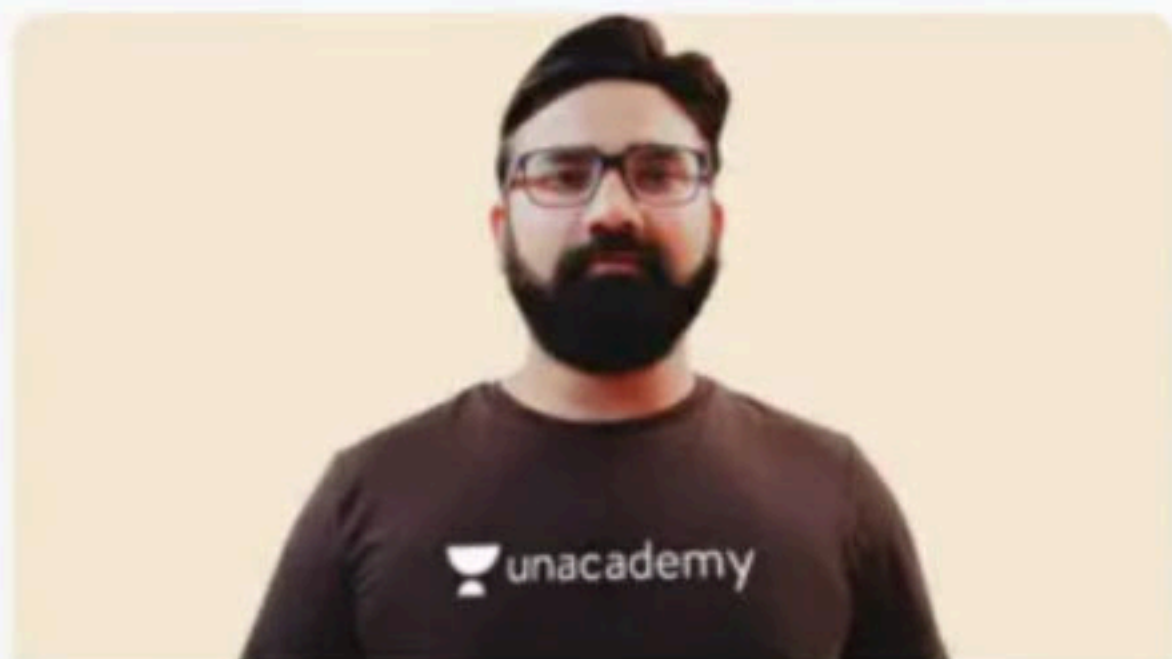


HINDI CHEMISTRY

प्रश्न मेला - V. K. Jaiswal Inorganic
Chemistry - Periodic Table -III

Starts on Nov 12, 8:00 PM

Kapil Rana

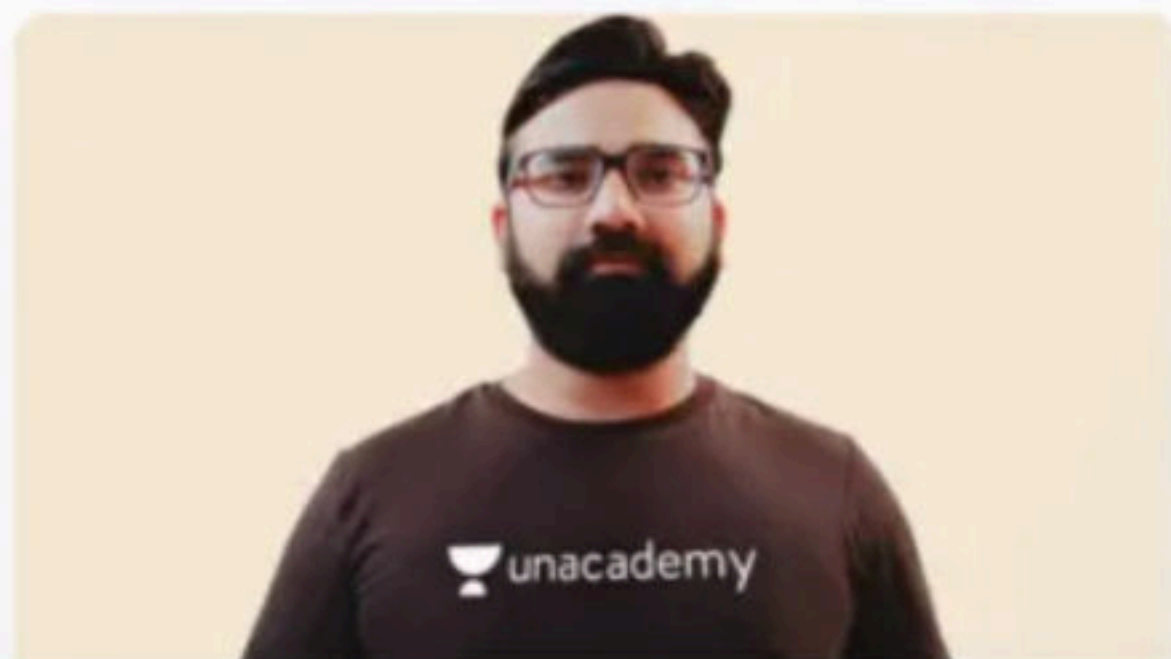


HINDI CHEMISTRY

प्रश्न मेला (Quiz) - Chemical Bonding
- 4

Starts on Nov 9, 8:30 AM

Kapil Rana



HINDI CHEMISTRY

प्रश्न मेला - V. K. Jaiswal Inorganic
Chemistry - Periodic Table

Starts on Nov 5, 8:00 PM

Kapil Rana

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Kapil Rana (IIT KGP)

Q.1 Which is not similar characteristic(s) about the electronic configuration of Be, Mg, Ca ?

(A) All the atoms have a pair of s-electrons in their outermost energy level

(B) All the atoms contain a pair of p-electrons in their outermost energy level

(C) All of them are not alkaline earth metals

(D) All are of second group of the periodic table

(B)

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Kapil Rana (IIT KGP)

Q.2 The elements with atomic number 117 and 120 are yet to be discovered. In which group would you place these elements when discovered ?

(A) 17, 2

(B) 16, 4

(C) 15, 3

(D) 18, 2

Sol.

Grp NO. 1 Grp. NO. 2



117

120

Grp NO. 18

2

10

18

36

54

86

117. 118.

"VKJ Series"

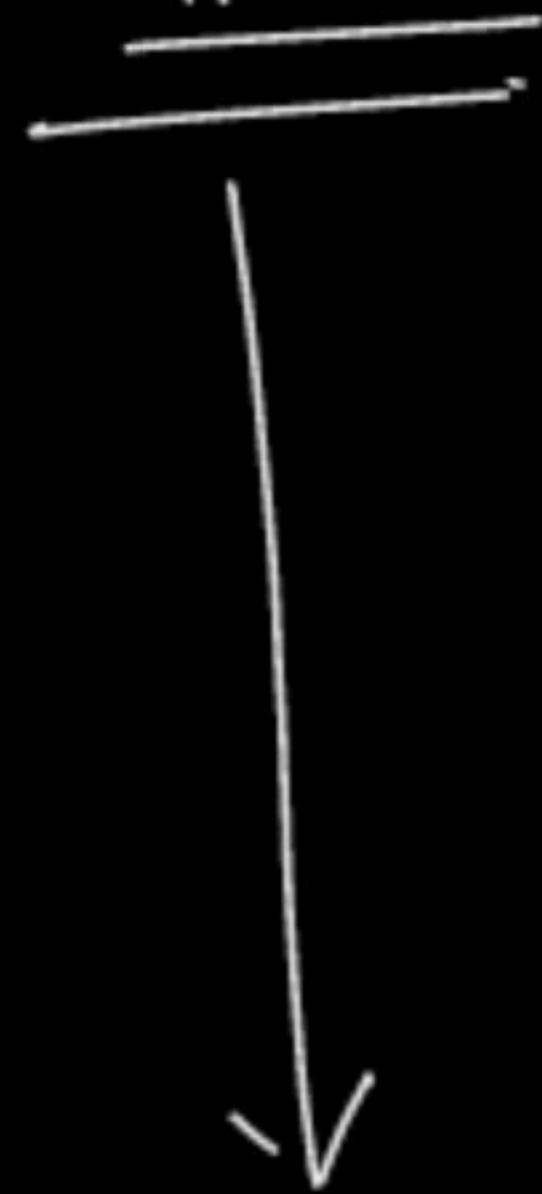
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Kapil Rana (IIT KGP)

Q.3 The most electropositive element possesses the electronic configuration :

- (A) $[\text{He}]2s^1$ (B) $[\text{Ne}]3s^2$ (C) $[\text{Xe}]6s^1$ (D) $[\text{Xe}]6s^2$

Sol: Grp. No 1



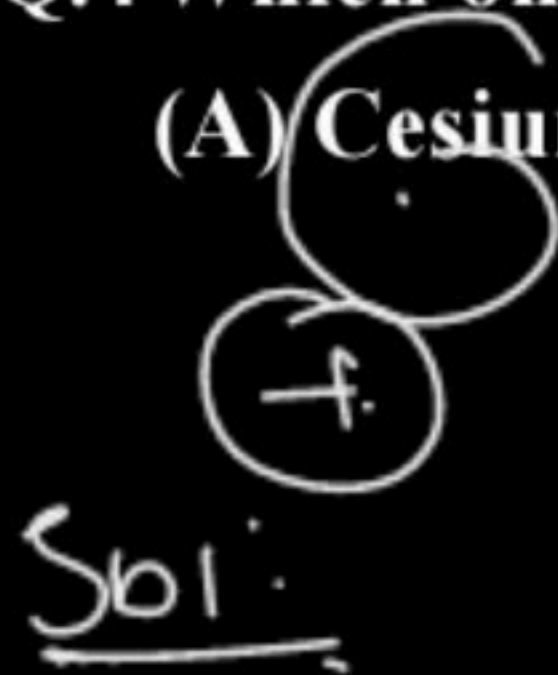
"VKJ Series"

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Kapil Rana (IIT KGP)

Q.4 Which one of the following elements shows both positive and negative oxidation states ?

(A) Cesium (B) Fluorine



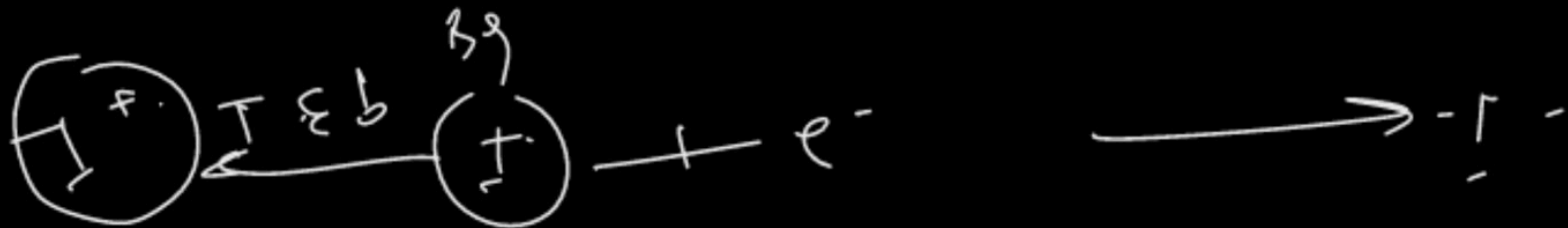
(C) Iodine



(D) Xenon



Non metal + e-



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Kapil Rana (IIT KGP)

Q.5 The number of elements present in fifth period is :

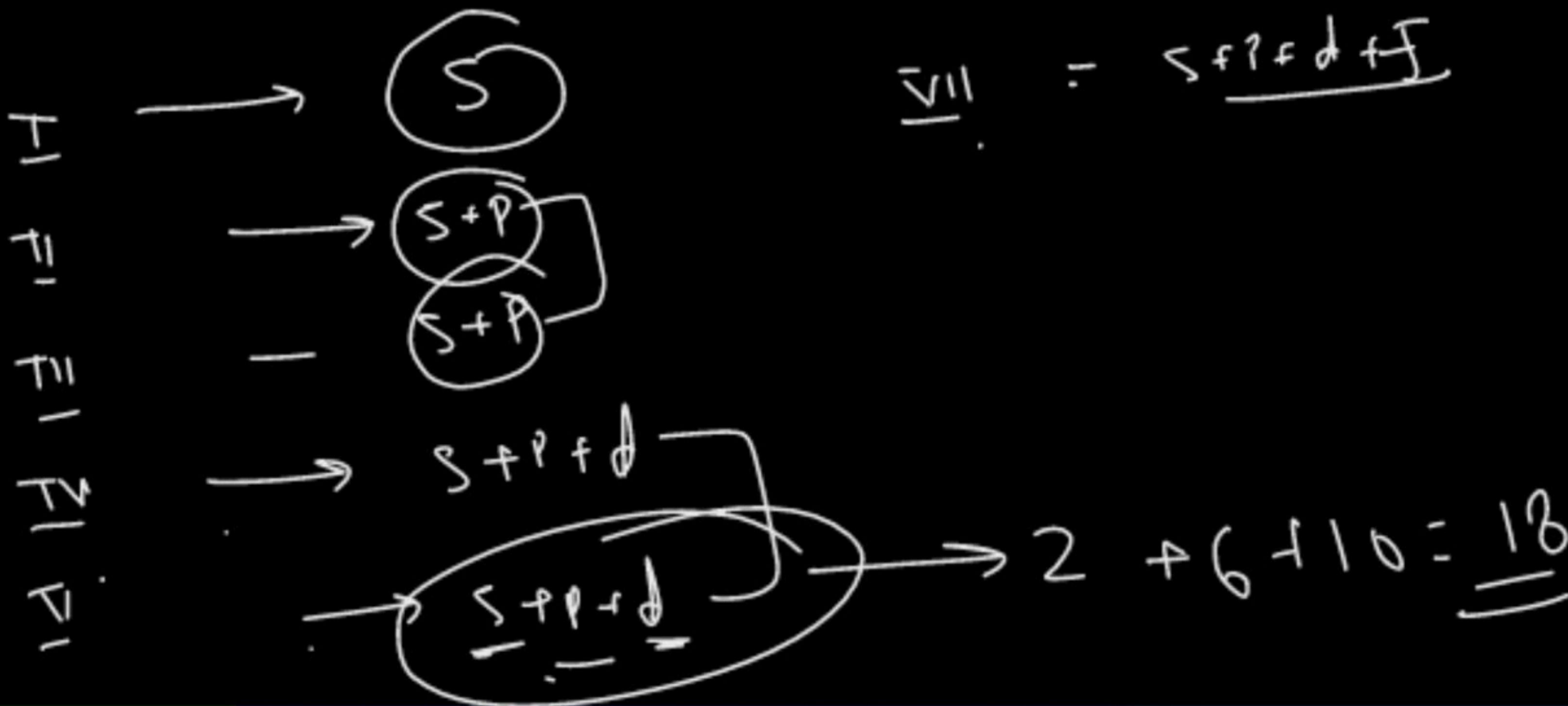
(A) 18

(B) 32

(C) 8

(D) 24

Sol.



"VKJ Series"

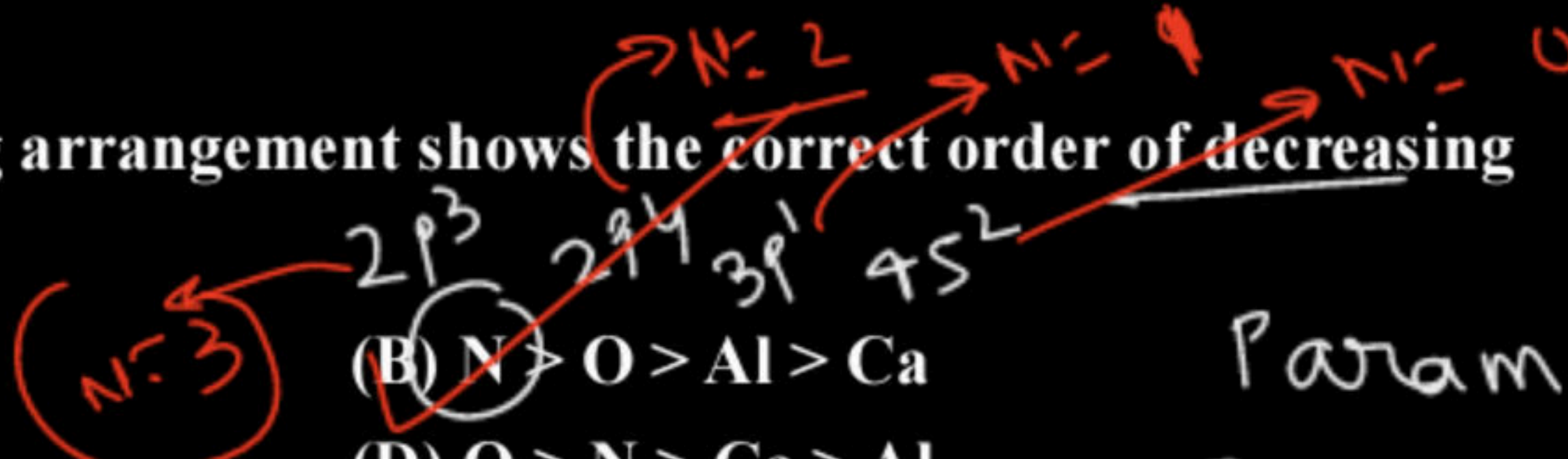
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Kapil Rana (IIT KGP)

Q.6 Which of the following arrangement shows the correct order of decreasing paramagnetism ?

- (A) $N > Al > O > Ca$
 (C) $O > N > Al > Ca$

- (B) $N > O > Al > Ca$
 (D) $O > N > Ca > Al$



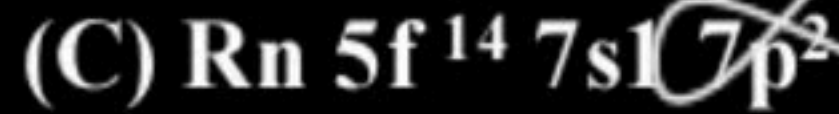
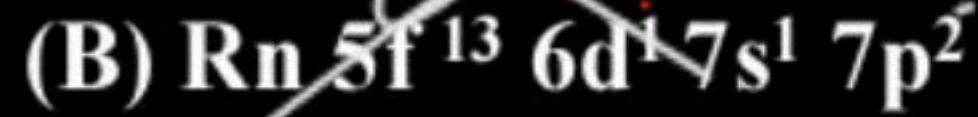
Paramagnetic
 $N = \text{No. of unpaired } e^-$

Attracted
by B field

$N = 0$
Diamagnetic

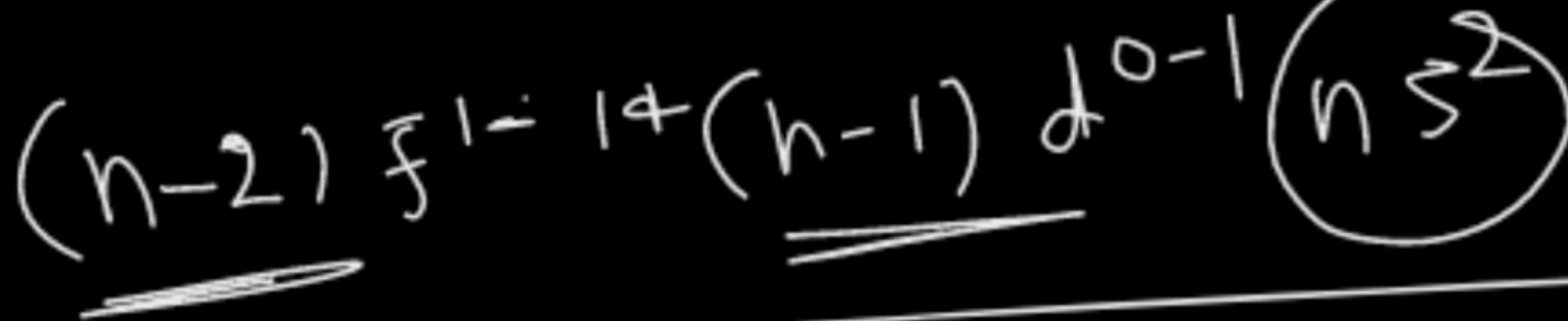
Referred
to B field

Q.7 The outer electronic structure of lawrencium (atomic number 103) is :



$n=7$

Sol: 90-103 → Actinoid series



$n-2$

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Kapil Rana (IIT KGP)

Q.8 The elements with the lowest atomic number that has a ground state electronic configuration

of

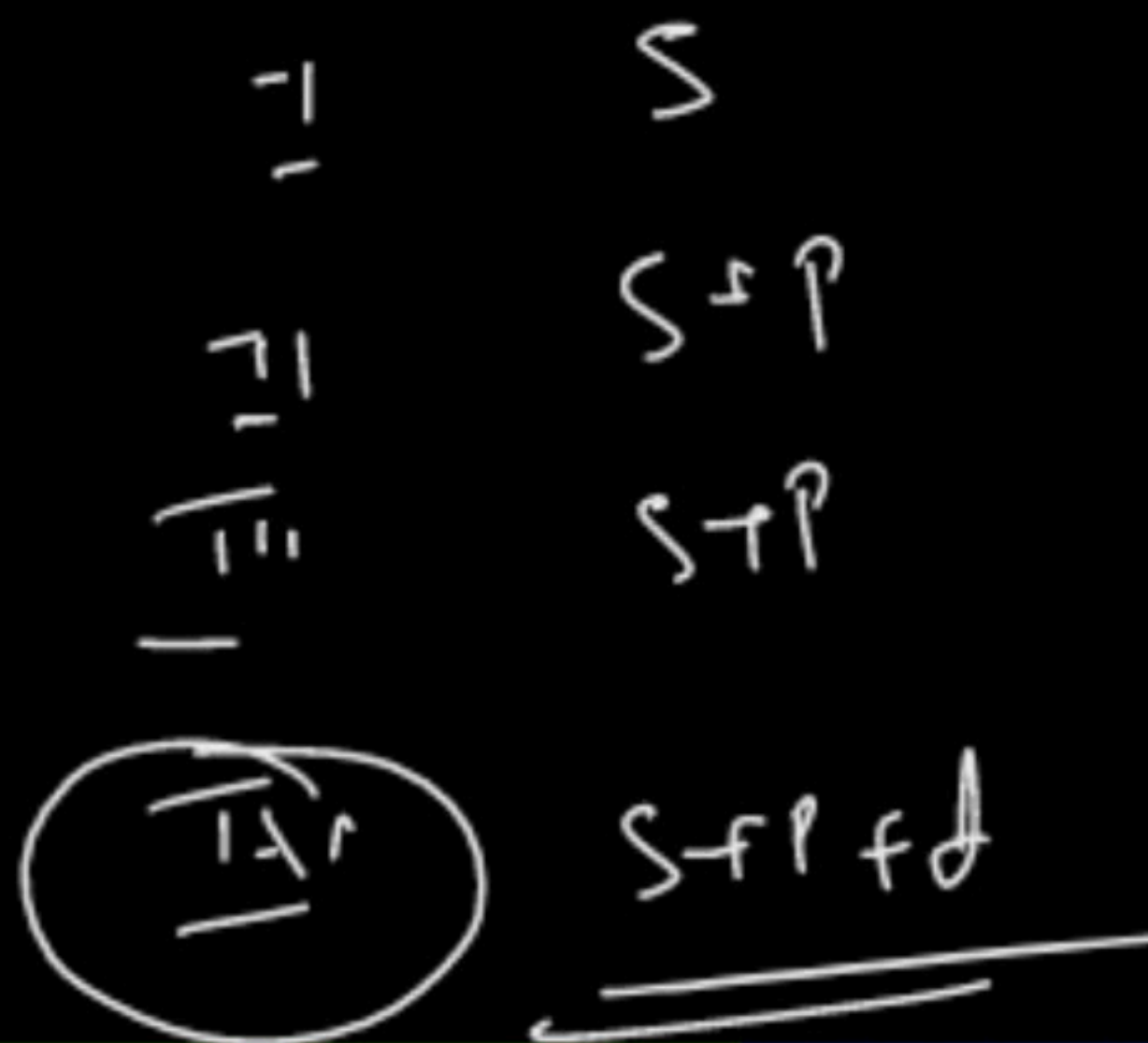
$(n-1)d^6 ns^2$ is located in the :

(A) fifth period (B) sixth period

(C) fourth period

(D) third period

Sol.



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Kapil Rana (IIT KGP)

Q.9 Which of the following sets of atomic numbers corresponds to elements of group 16 ?

(A) 8, 16, 32, 54

(B) 16, 34, 52, 84

(C) 8, 16, 34, 52

(D) 10, 16, 32, 50

Sol:

Grp 16.12
O - 8
S - 16
Se - 34
Te - 82

2, 8, 8, 18, 18, 32

Q.10 The atomic numbers of the metallic and non-metallic elements which are liquid at room temperature respectively are:

(A) 55, 87

(B) 33, 87

(C) 35, 80

(D) 80, 35

Sol:

80 = Hg
35

80
35

"VKJ Series"

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Kapil Rana (IIT KGP)

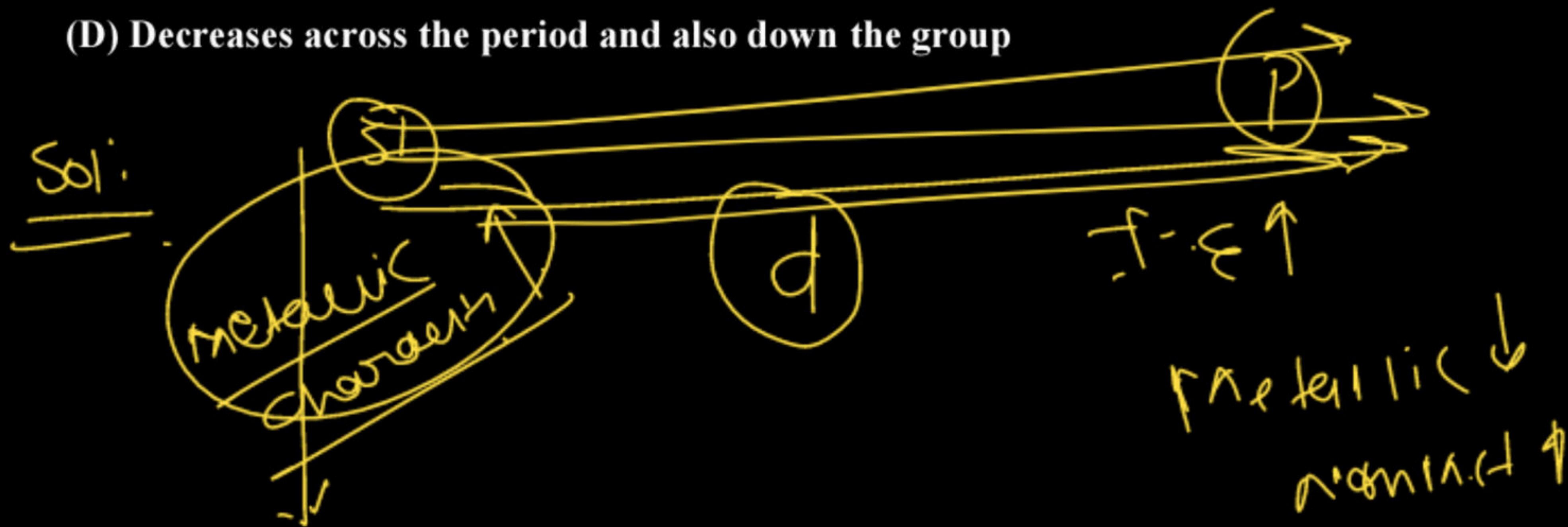
Q.11 In the periodic table, metallic character of the elements shows one of the following trend :

(A) Decreases down the group and increases across the period

(B) Increases down the group and decreases across the period

(C) Increases across the period and also down the group

(D) Decreases across the period and also down the group



"VKJ Series"

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Kapil Rana (IIT KGP)

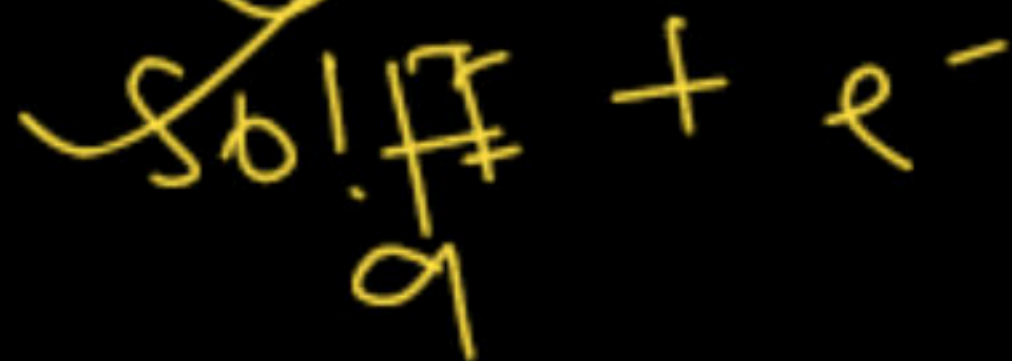
Q.12 Nucleus of an element contains 9 protons. Its valency would be :

(A) 1

(B) 2

(C) 3

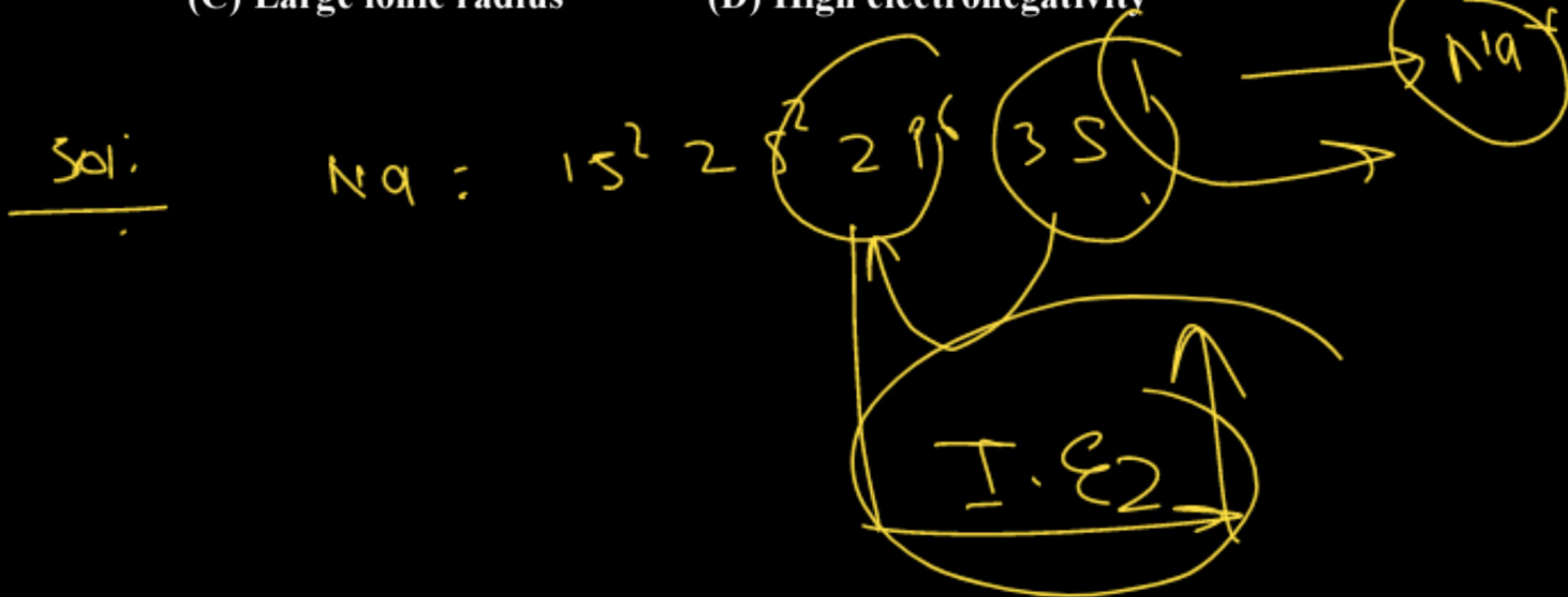
(D) 5



combining capacity of element

Q.14 Sodium generally does not shown oxidation state of +2, because of its :

- (A) High first ionisation potential (B) High second ionization potential
(C) Large ionic radius (D) High electronegativity



Q.16 According to modern periodic law the properties of elements repeat at regular intervals when the elements are arranged in order of:

- (A) decreasing atomic number (B) increasing atomic weight
(C) increasing atomic number (D) decreasing atomic weights

Sol:



“VKJ Series”

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off on Plus

Kapil Rana (IIT KGP)

Q.17 Give the symbol of the elements of lowest atomic number that has three 2p electrons :

(A) Mg

(B) P

(C) N

(D) Si



Sol:



"VKJ Series"

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Kapil Rana (IIT KGP)

Q.18 In the fourth period of the periodic table, how many elements have one or more 4d electrons?

- (A) 2 (B) 18 (C) 0 (D) 6

Sol:

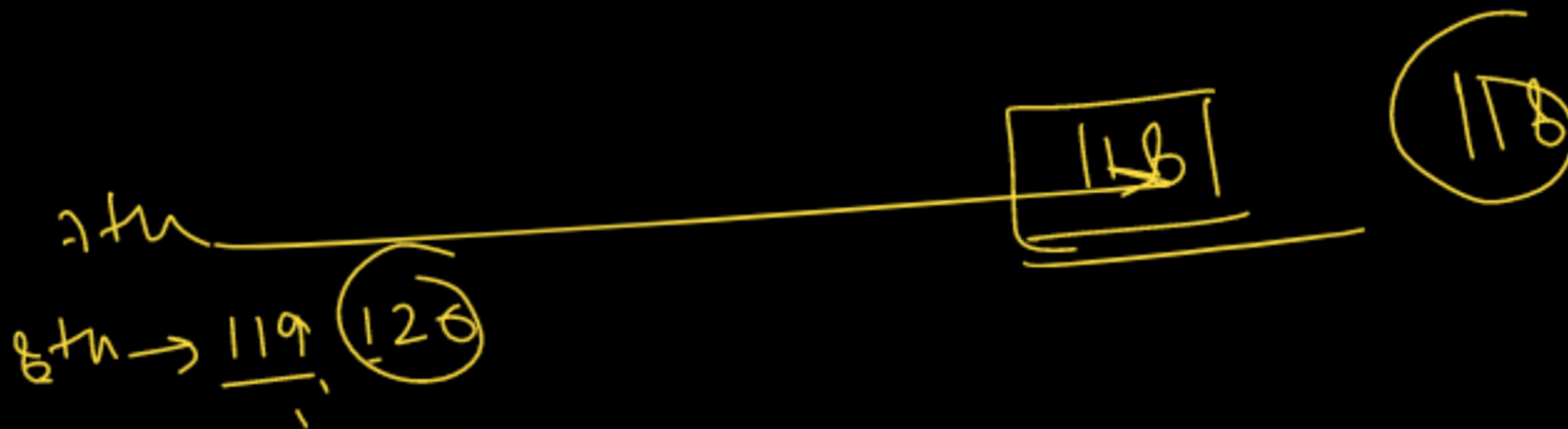
I + s
II + s+p
III + s+p
IV + s+p+d (3d)

Q.19 Assuming that elements are formed to complete the seventh period, what would be the atomic number of the alkaline earth metal of the eighth period?

(A) 113 (B) 120 (C) 119 (D) 106



Gr. No 16

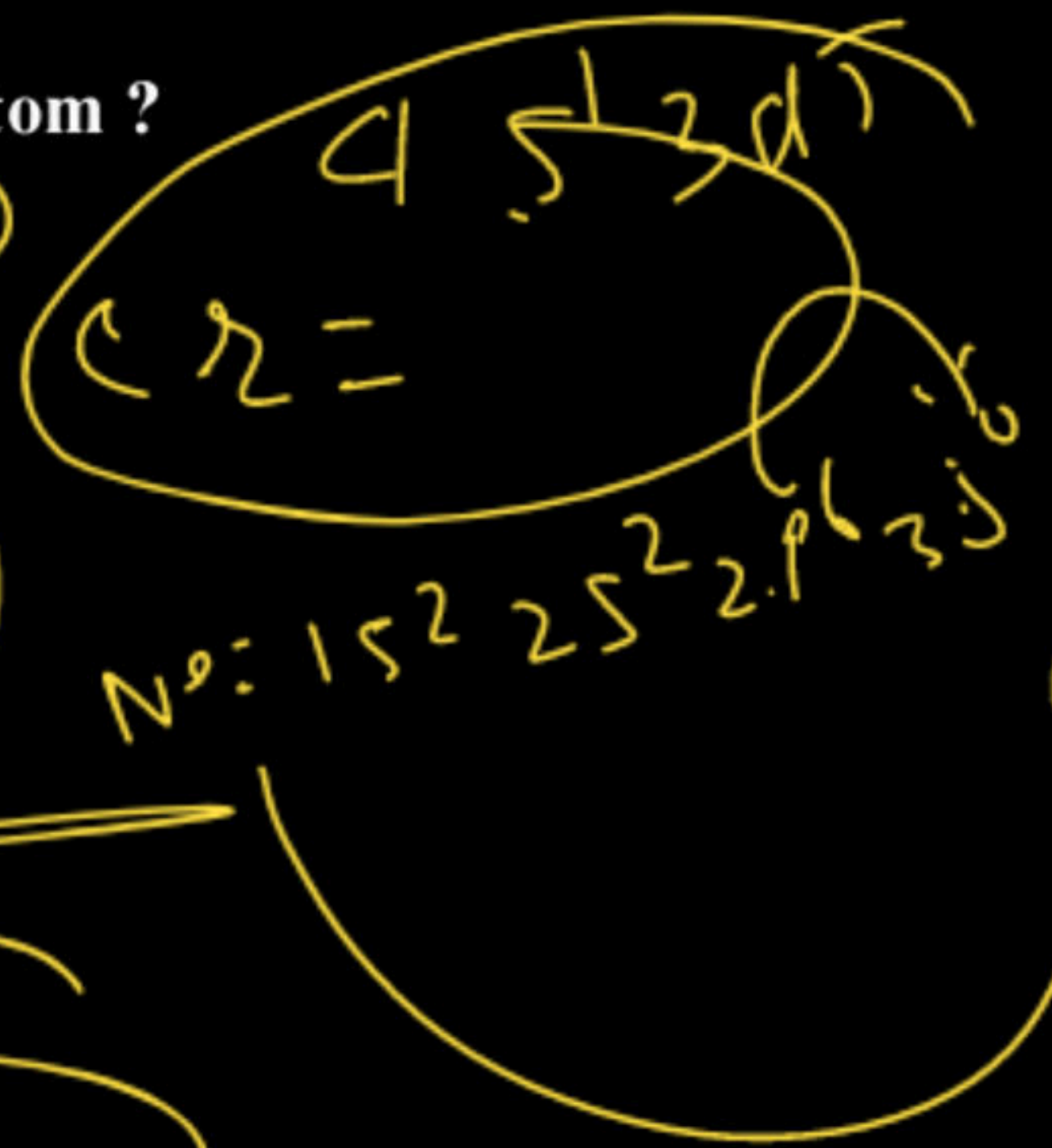
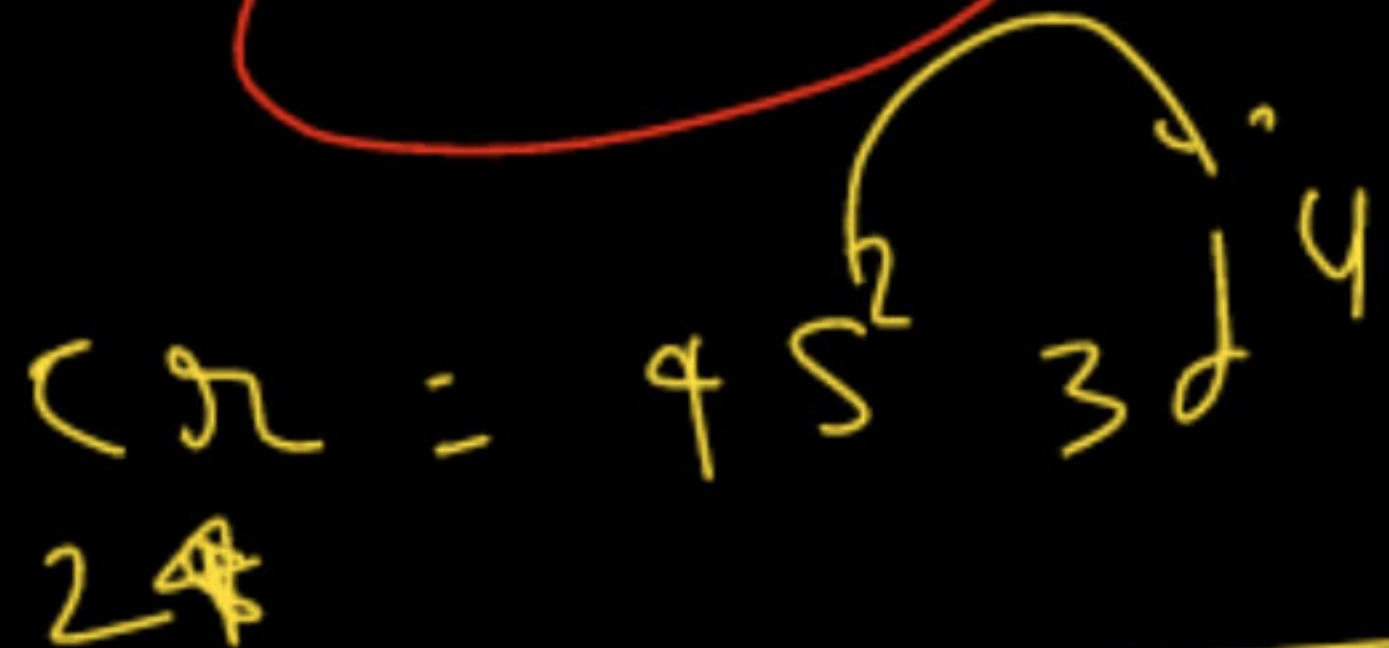
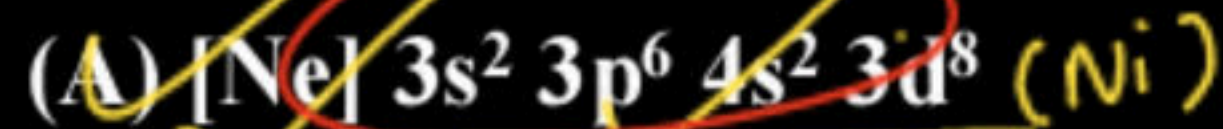


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Kapil Rana (IIT KGP)

Q.20 Which of the following represents an excited state of an atom ?

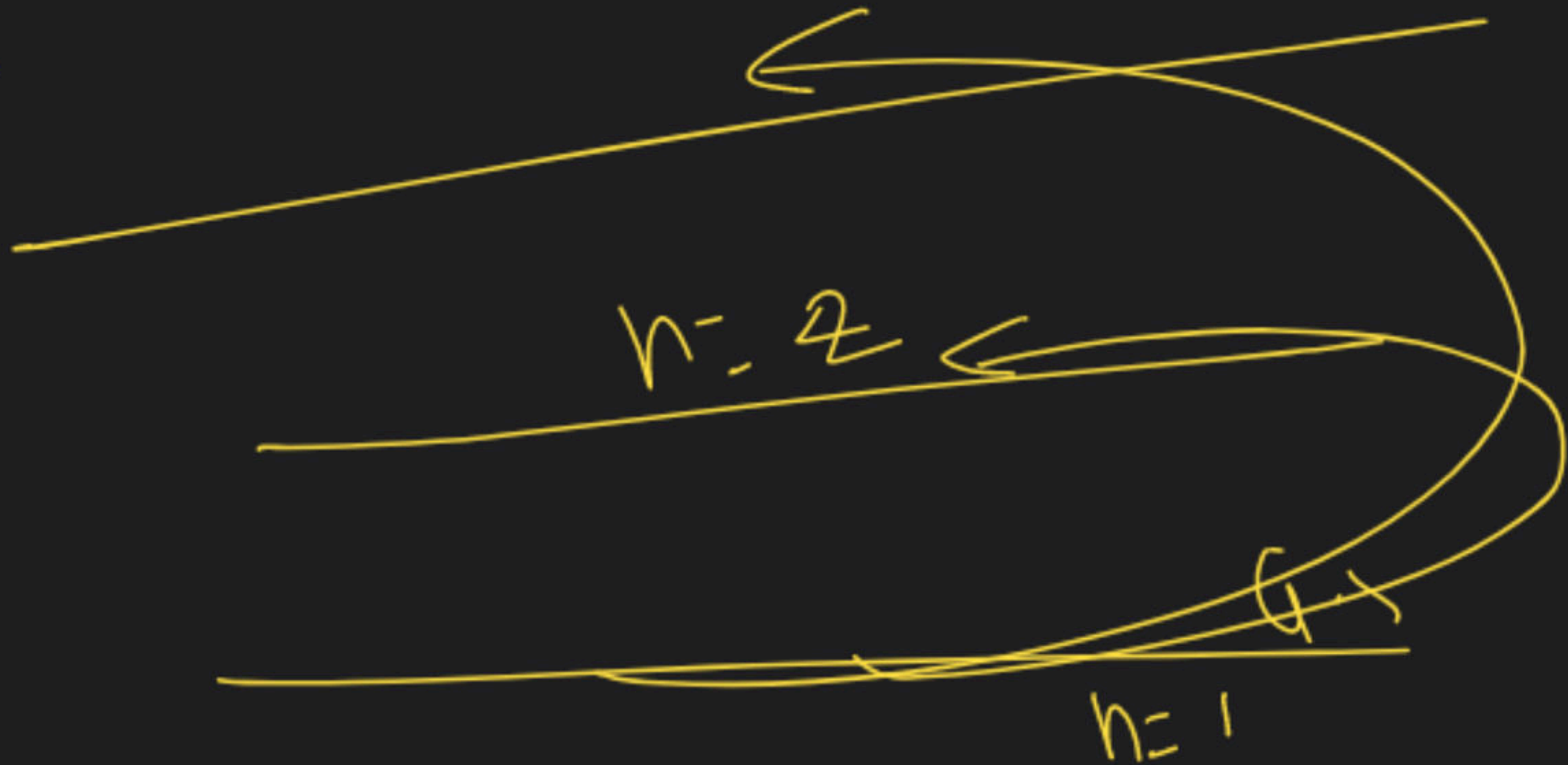


Room temp

(Ne) $3s^2 3p^6 4s^2 3d^4$







Q.22 Which one of the following is a different pair ?

(A) Li, Na

(B) Be, Ba

(C) N, As

(D) O, At

Sol:

O

S

Se

Te

Po

"VKJ Series"

Use the referral Code : "KRSIR" for 10%
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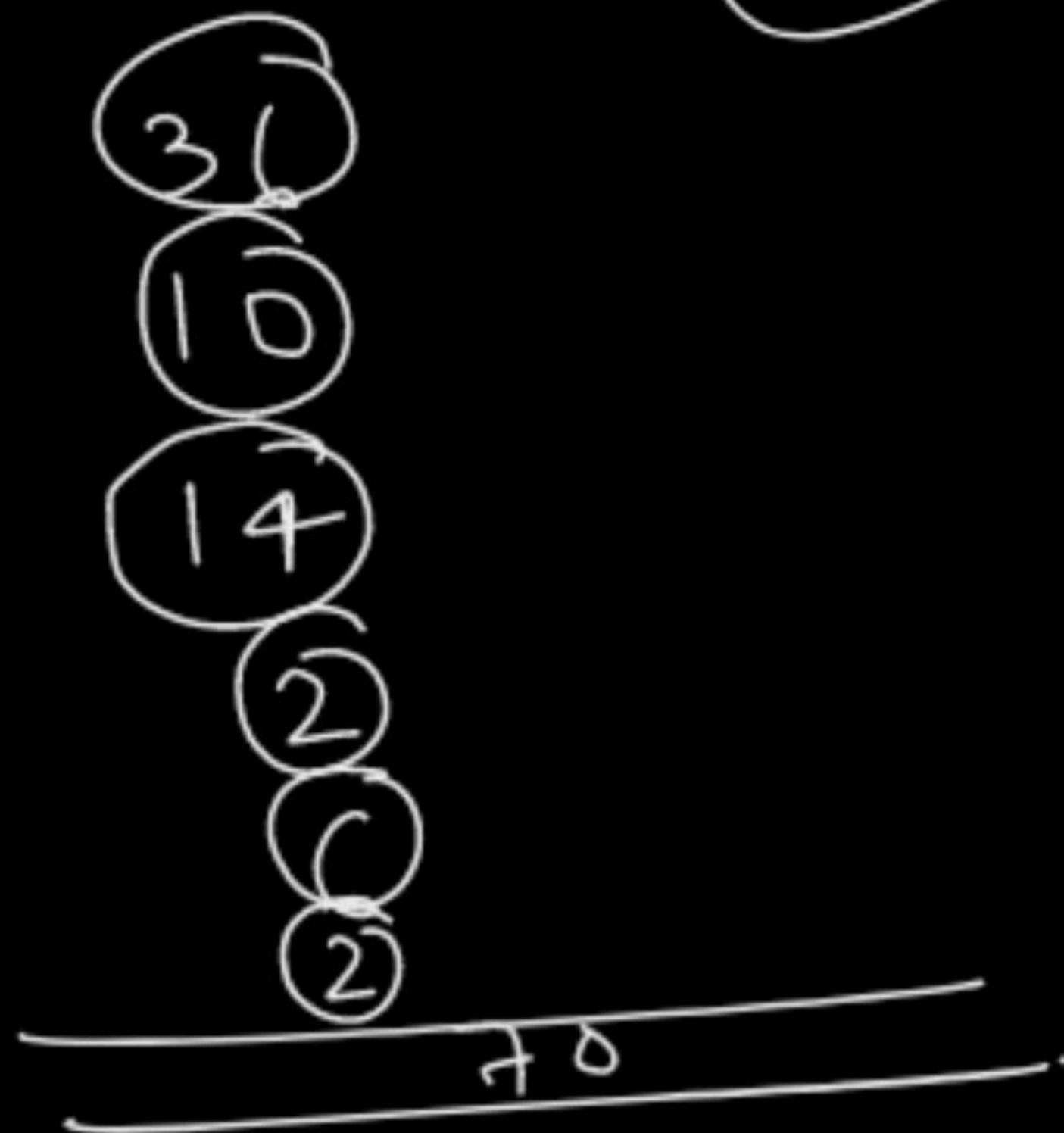
Kapil Rana (IIT KGP)

Q.23 The element having electronic configuration $[\text{Kr}]4d^{10} 4f^{14}, 5s^2 5p^6, 6s^2$ belongs to :

(A) s-block (B) p-block (C) d-block (D) f-block

$$70e^- = \underline{\underline{70?}}$$

Sol.



$$58 - 71$$

→ Lanthanoid
Seq

"VKJ Series"

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Kapil Rana (IIT KGP)

Q.26 An element whose IUPAC name is ununtrium (Uut) belongs to :

(A) s-block element

~~(B) p-block element~~

(C) d-block element

(D) Transition element

Sol: Uut (113)

Qp. No 18

13 14 15 16 17
113 114 115 116 117 118

"VKJ Series"

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Kapil Rana (IIT KGP)

Q.27 Which of the following is not representative element?

- (A) Tellurium (B) Tantalum (C) Thallium (D) Astatine

16

71

81

85

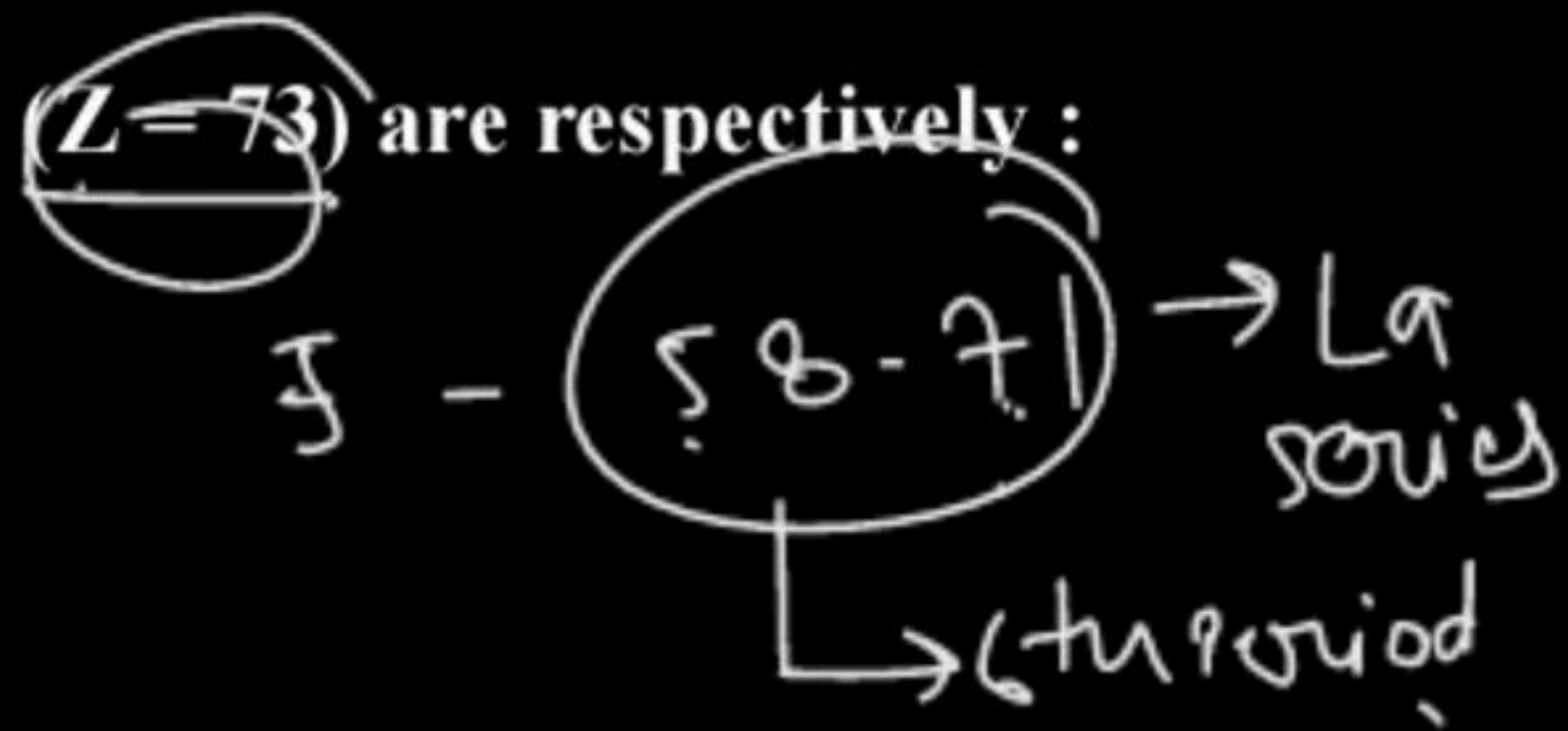
S F X

Solution:

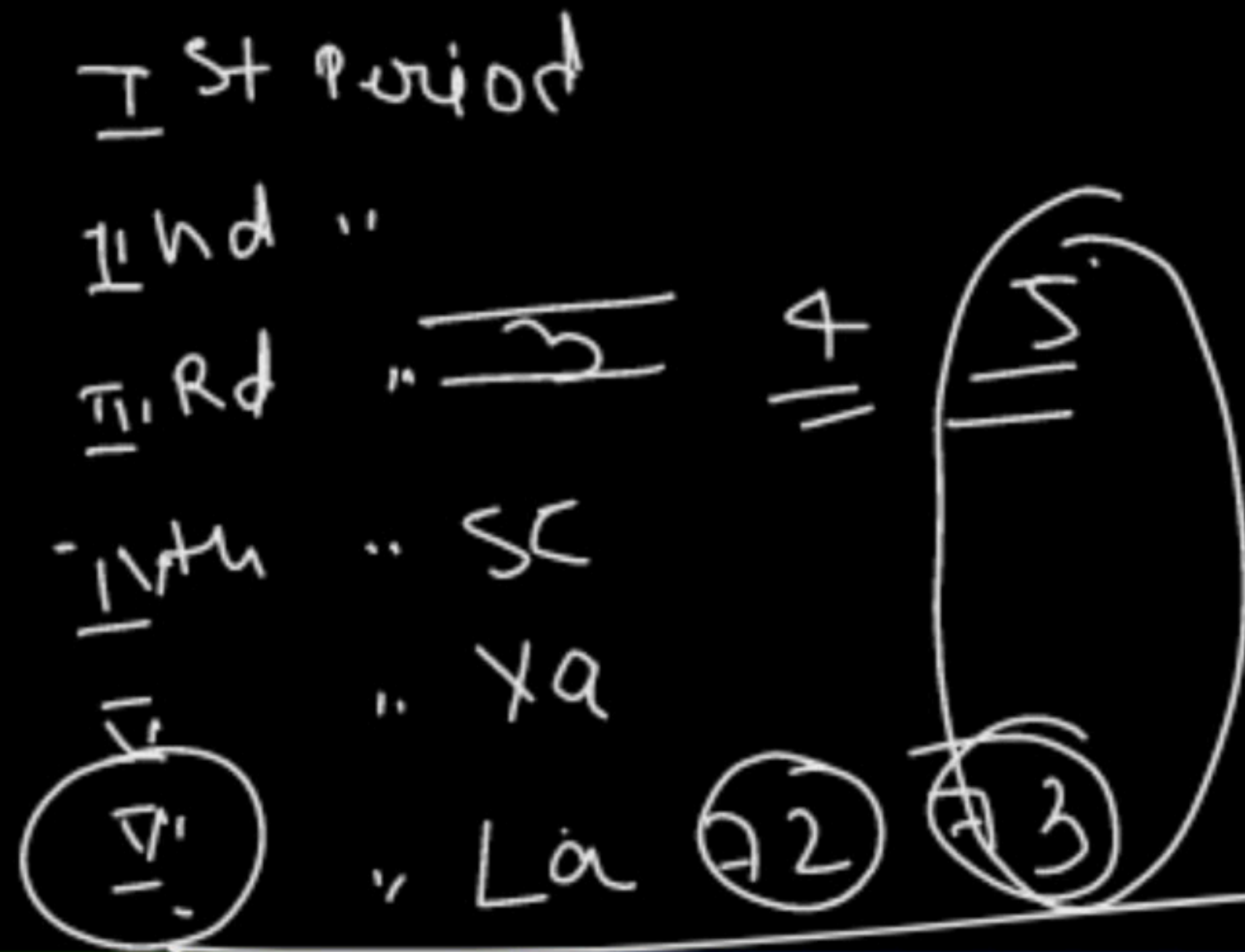
B

Q.28 The period number and group number of "Tantalum" ($Z=73$) are respectively :

- (A) 5, 7 (B) 6, 13 (C) ~~6, 5~~ (D) None of these



Sol.



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Kapil Rana (IIT KGP)

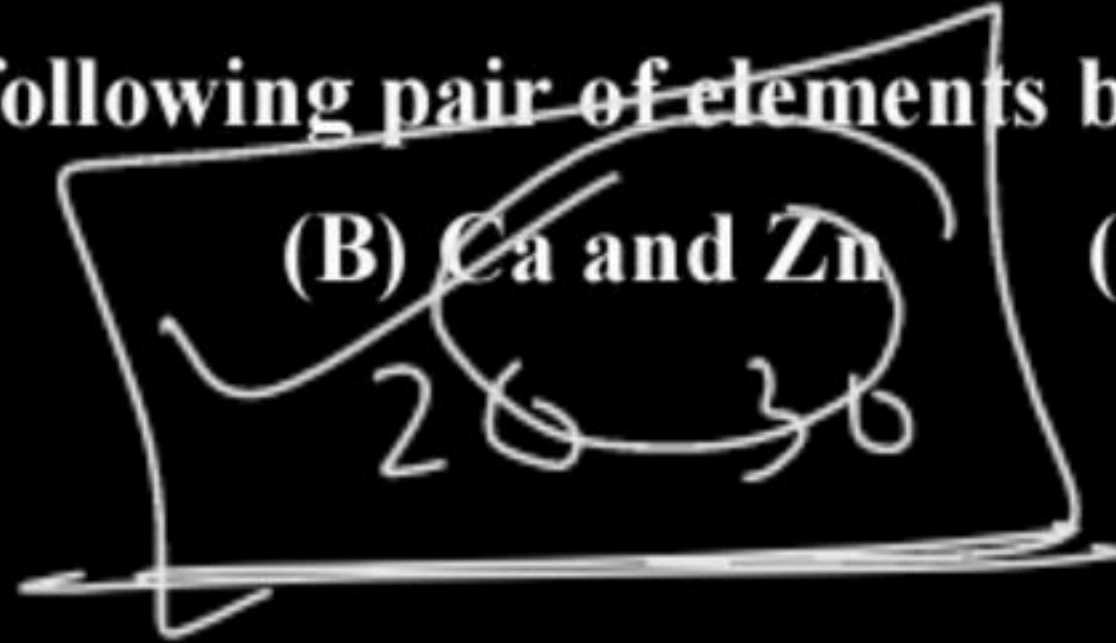
Q.29 Which of the following pair of elements belong to the same period ?

(A) Mg and Sb

(B) Ca and Zn

(C) Na and Ca

(D) Ca and Cl



Sol:

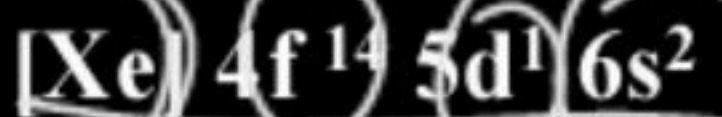


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Kapil Rana (IIT KGP)

Q.30 Consider the following electronic configuration of an element (P) :



= 7

Then correct statement about element 'P' is :

- (A) It belongs to 6th period and 1st group
- (B) It belongs to 6th period and 2nd group
- (C) It belongs to 6th period and 3rd group
- (D) None of these

5 4
14
1
2

71

58-71

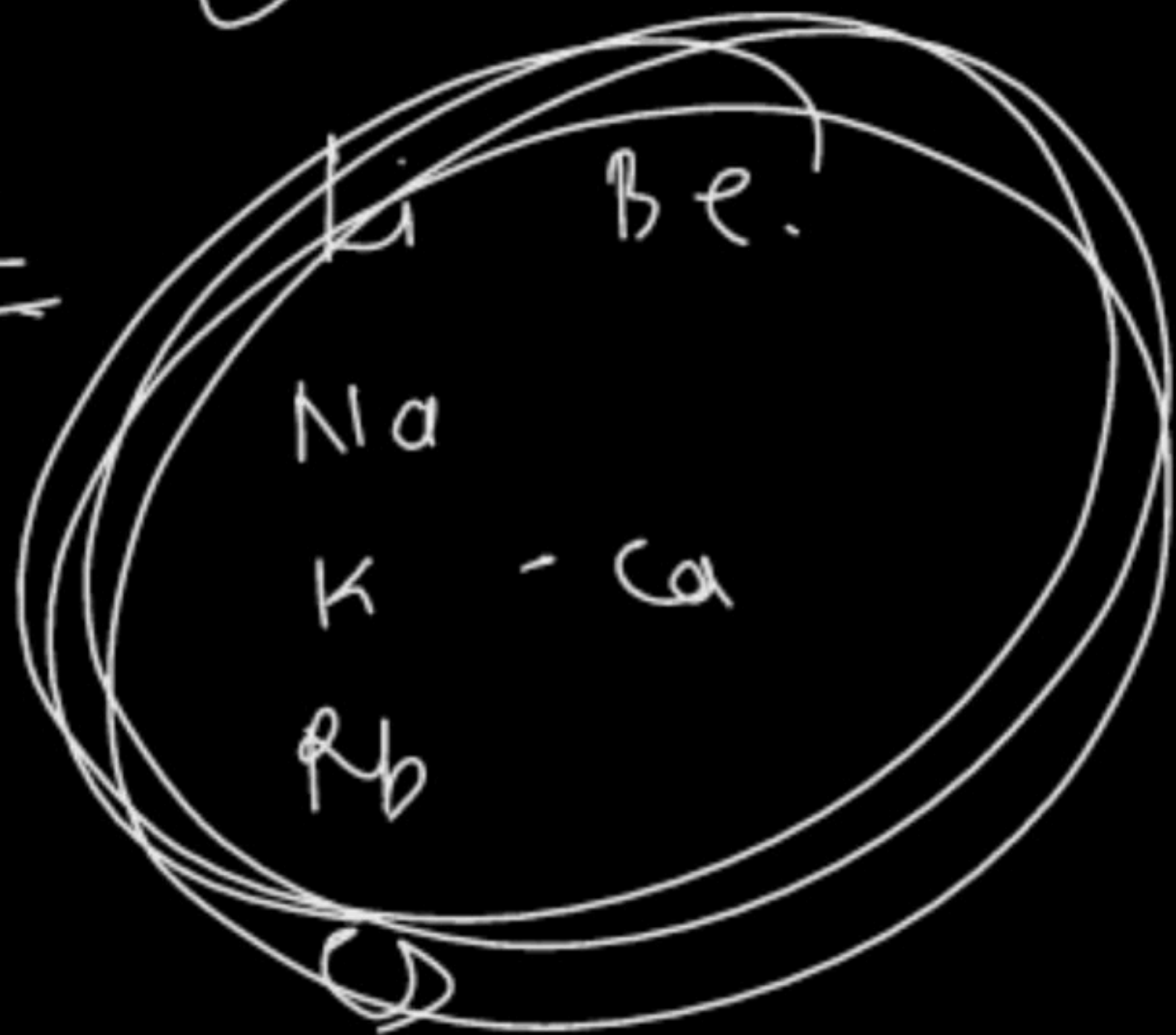
La series

5th period
+ 3d gp

Q.31 Which of the following metal is highest electropositive (metallic) in nature ?

- (A) Be (B) Rb (C) Mn (D) Tl

Sol:



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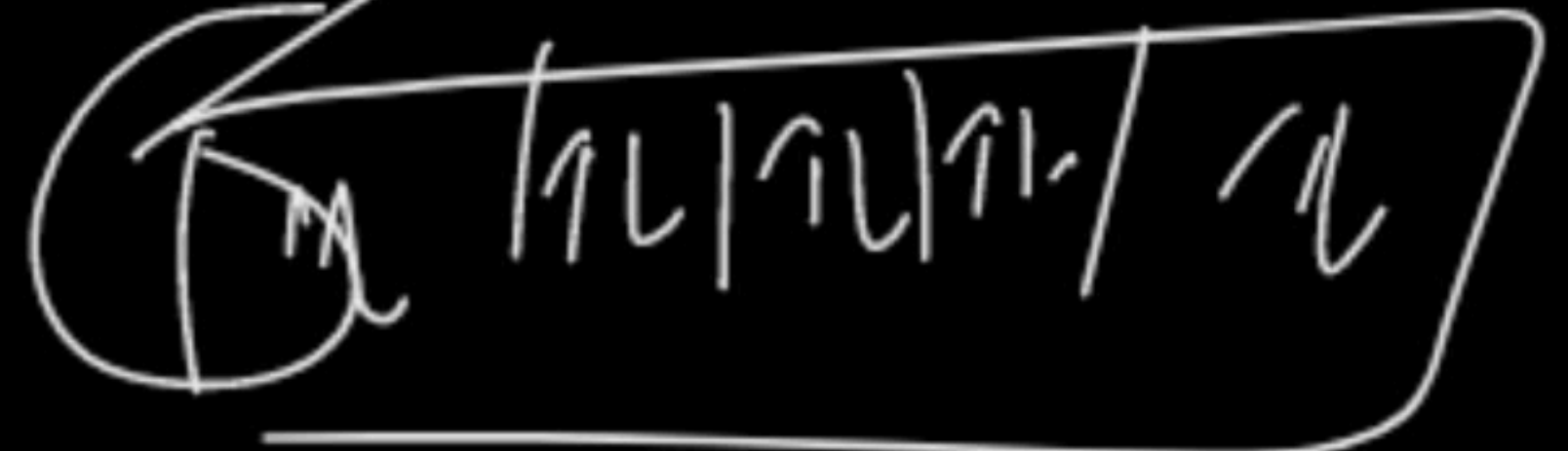
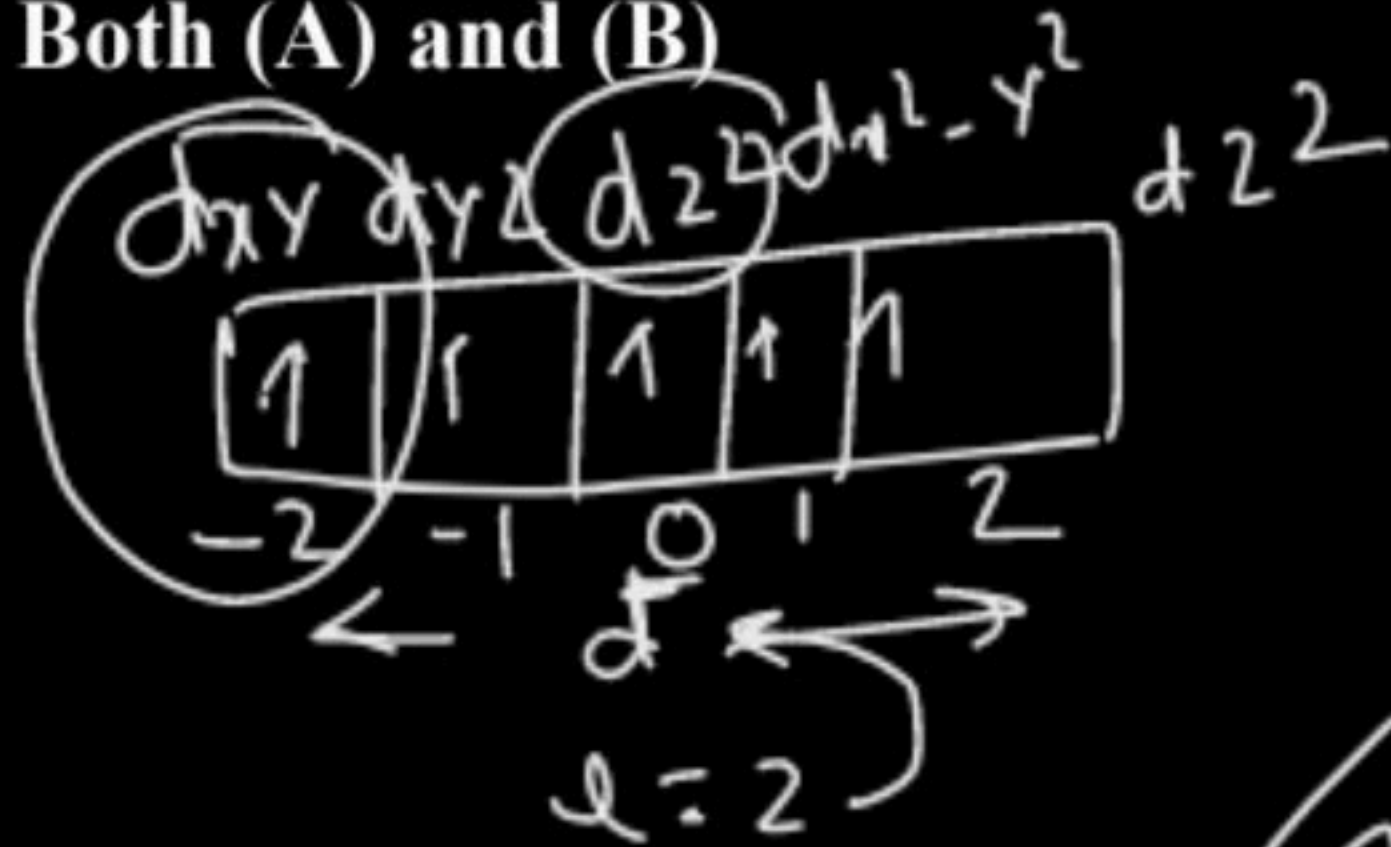
Kapil Rana (IIT KGP)

Q.32 Which of the following species must have maximum number of electrons in 'd_{xy}' orbital ?

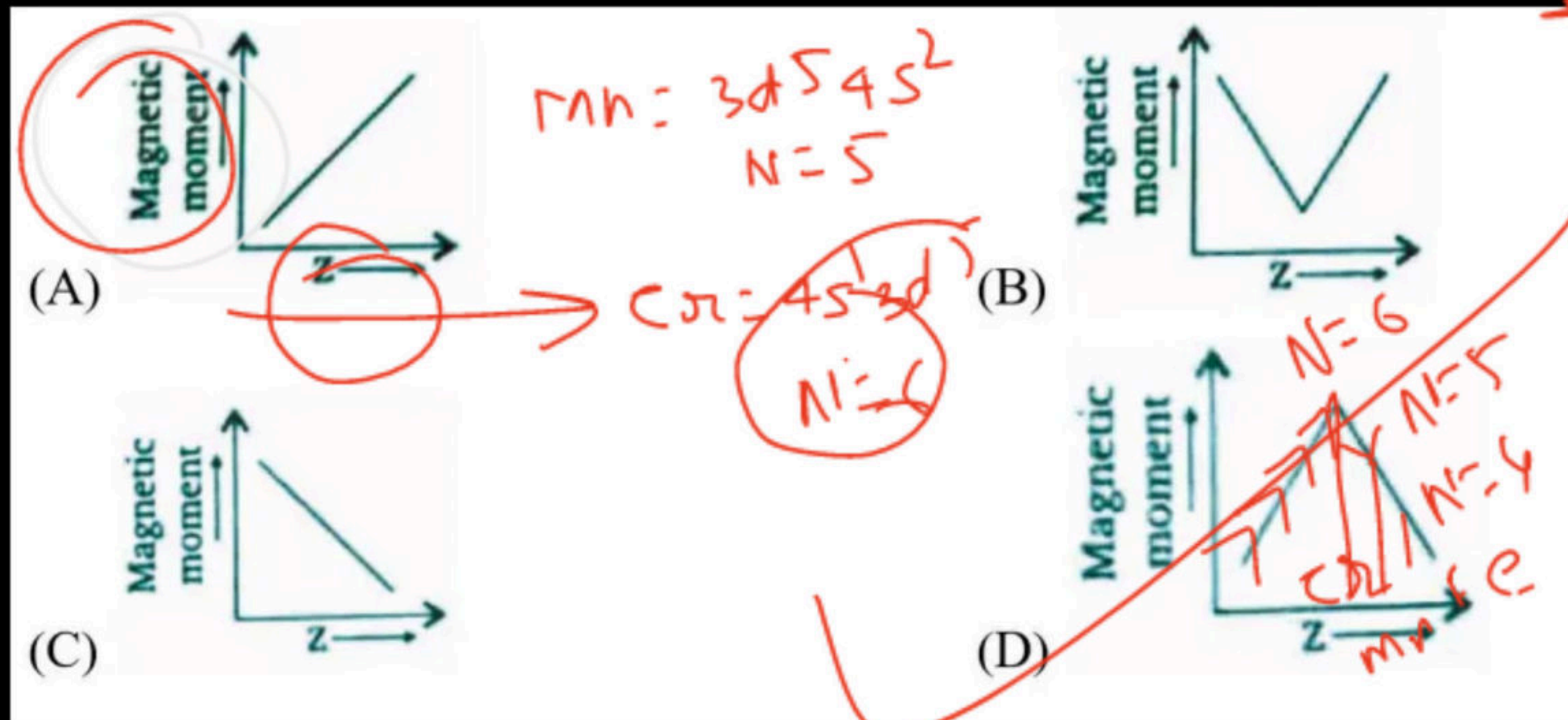
- (A) Cr (B) Fe³⁺ (C) Cr⁺ (D) Both (A) and (B)

Sol:

Cr =



Q.33 Which of the following graph is correct representation between atomic number (Z) and magnetic moment of d-block elements ? [Outer electronic configuration : $(n-1)d^x ns^{1 \text{ or } 2}$]



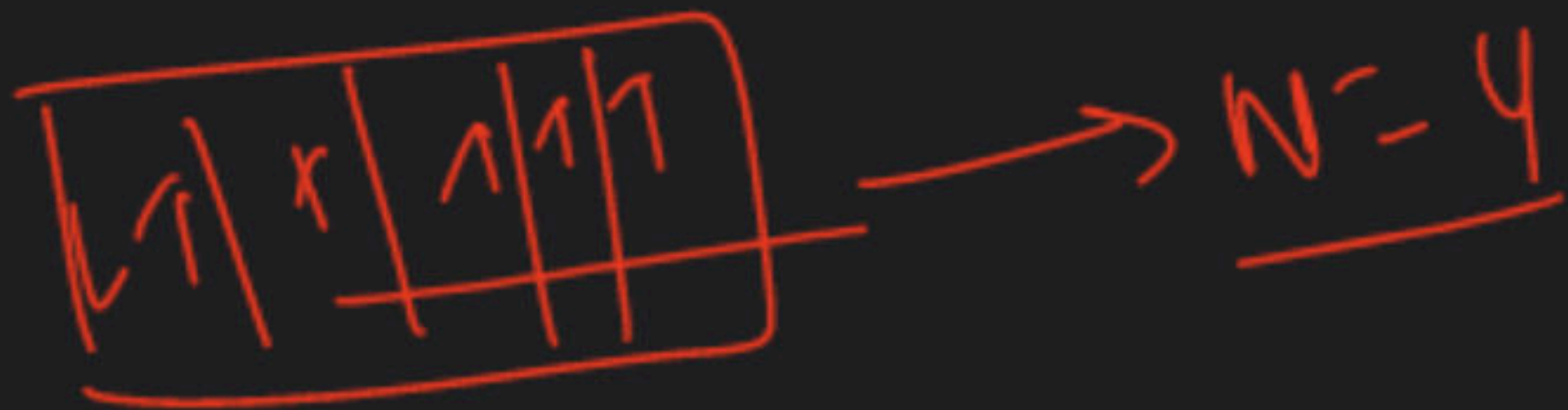
$MS = \sqrt{n(n+2)}$
BM

Sc Ti V Cr Mn
 d^1 d^2 d^3 d^5 $3d^5$
 $4s$ $4s^2$
 Fe Co Ni Cu Zn

"VKJ Series"

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Kapil Rana (IIT KGP)

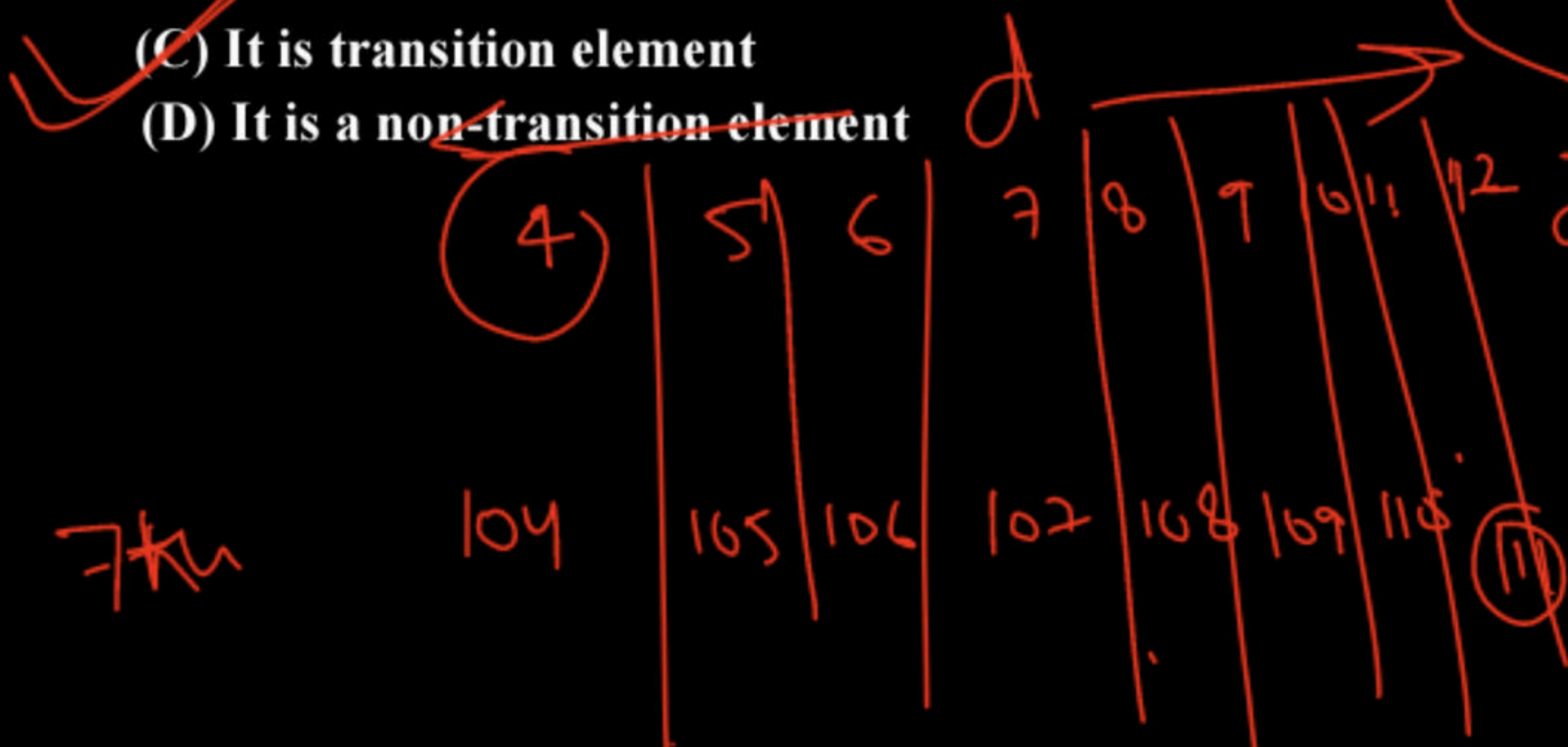




Q.34 If IUPAC name of an element is "unununium" then correct statement regarding element is :

- (A) It is an inner transition element
- (B) It belongs to 8th period in periodic table
- (C) It is transition element
- (D) It is a non-transition element

Sol: unununium



90-110
 110-118
 7th
 8th

Q.35 Which property decreases from left to right across the periodic table and increases from top to bottom?

(i) Atomic radius character

(ii) ~~Electronegativity~~

(iii) ~~Ionisation energy~~

(iv) Metallic

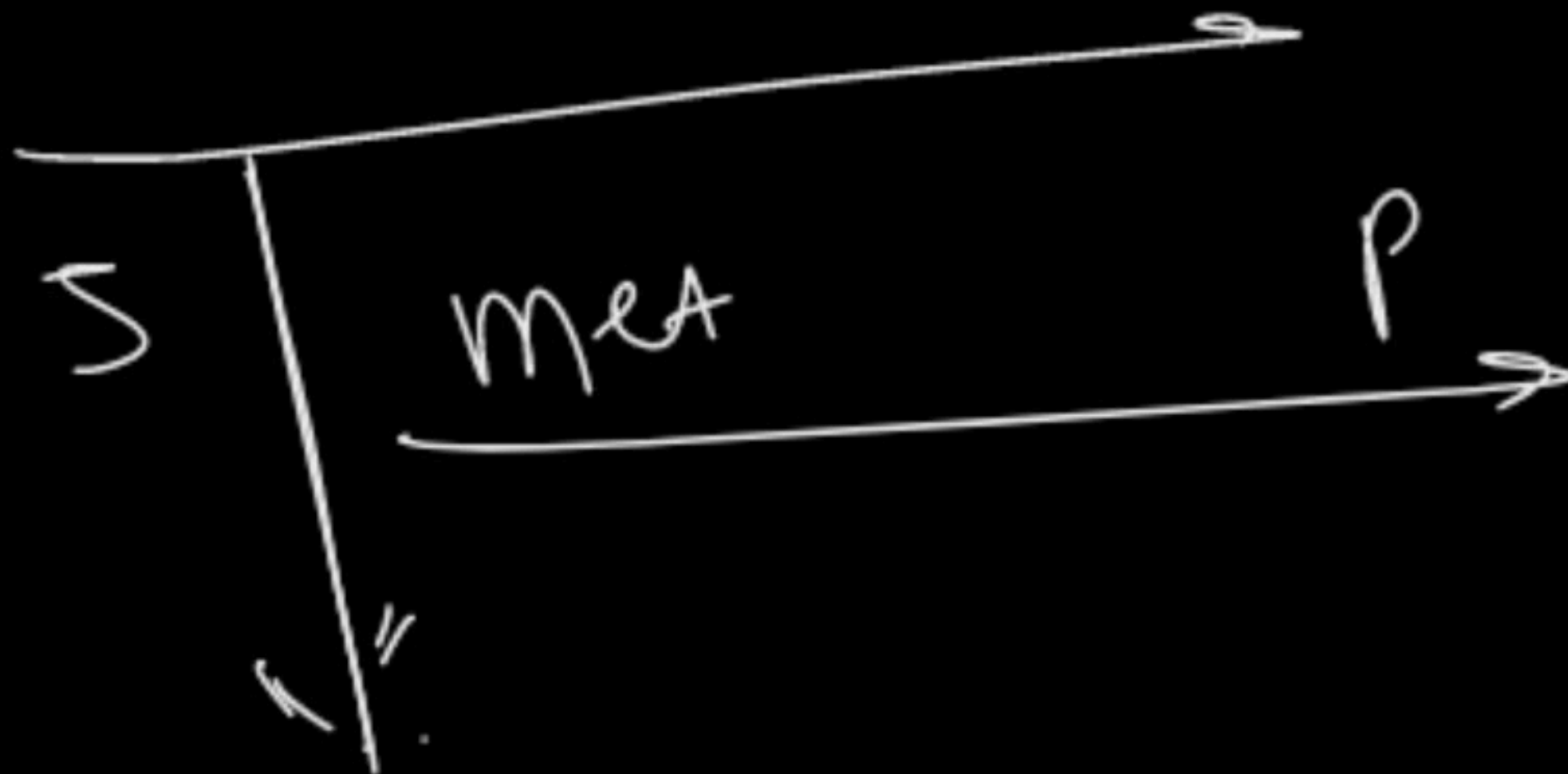
(A) (i) only

(B) (i), (ii) and (iii)

(C) (i), (iii) and (iv)

(D) (i) and (iv)

Sol:

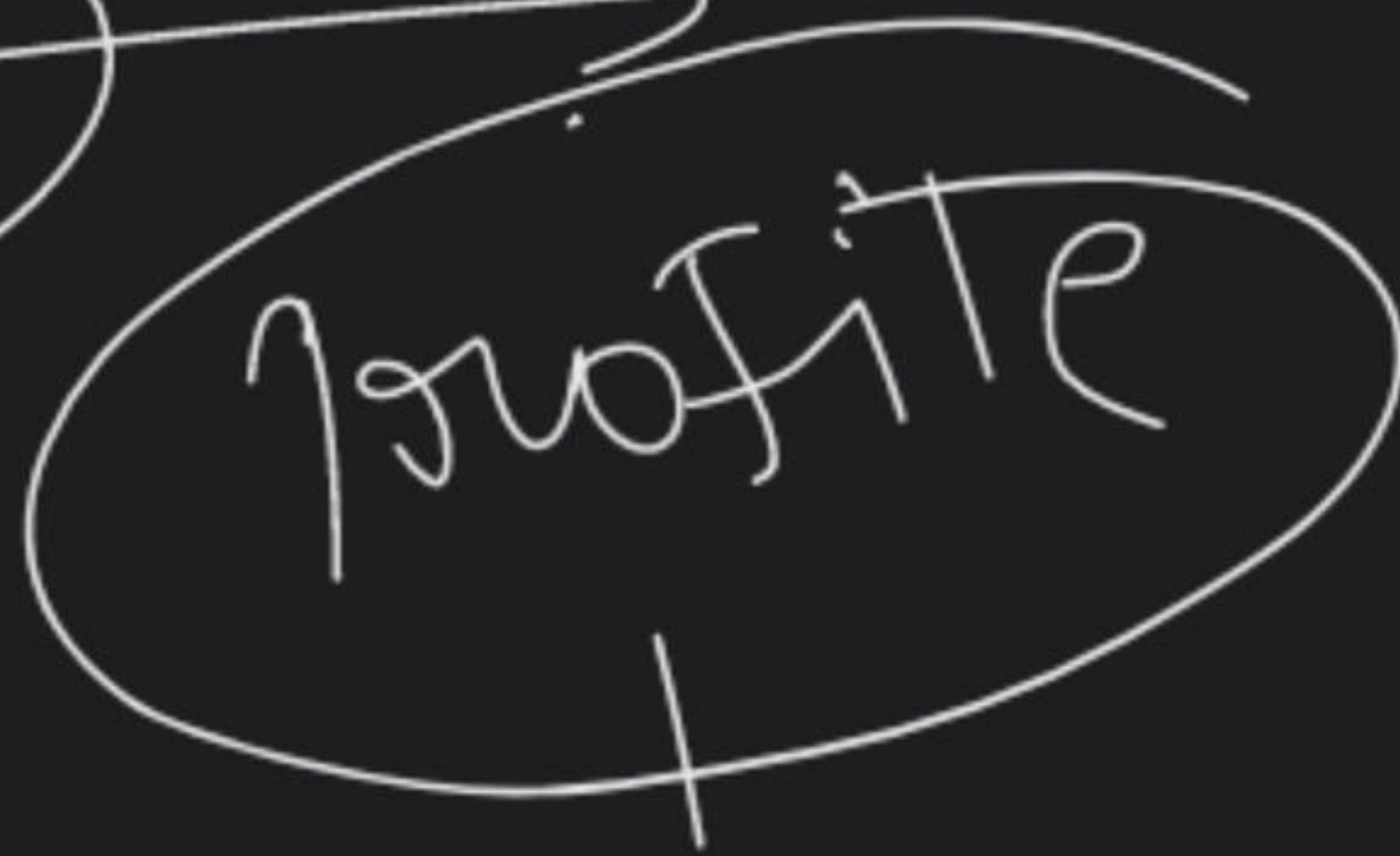
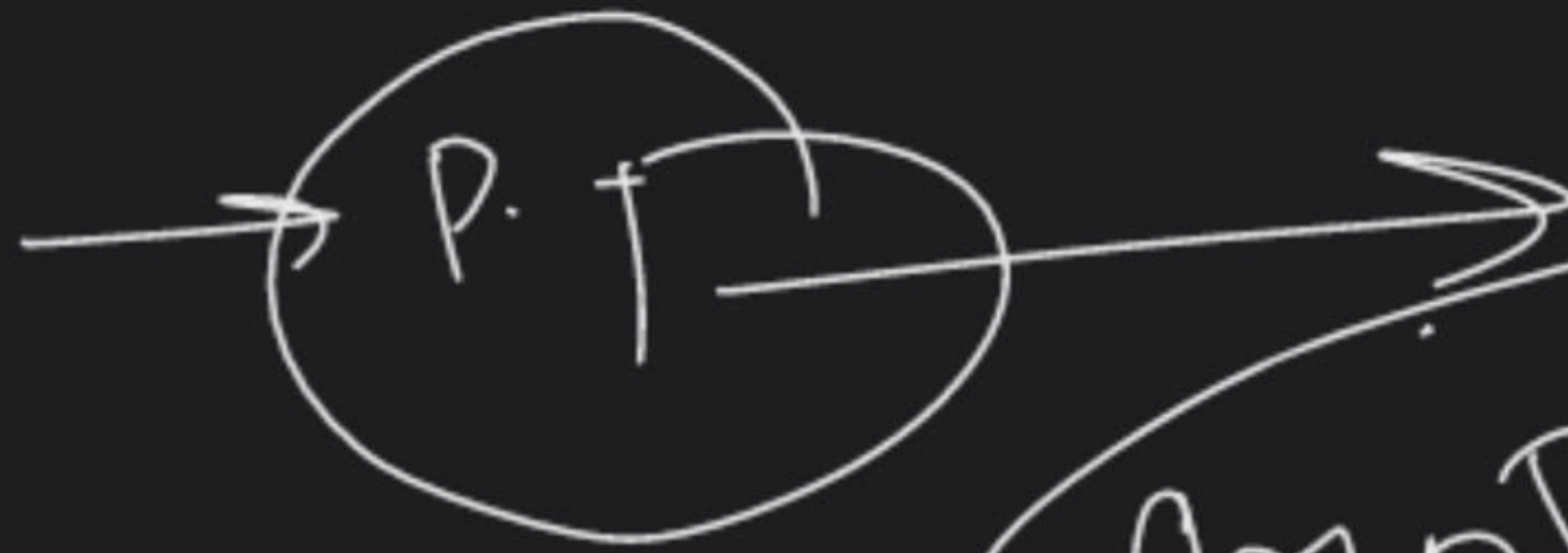


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Kapil Rana (IIT KGP)

VK j



message

Q.36 Consider the following information about element P and Q :

	Period number	Group number
P	2	15
Q	3	2

Then formula of the compound formed by P and Q element is :

PQ **(B) P₃Q₂** **(C) P₂Q₃** **(D) PQ₂**

“VKJ Series”

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off on Plus

Kapil Rana (IIT KGP)

Q.37 Which electronic configuration must represent an atom in an excited state ?

- (A) $1s^2, 2s^2 2p^1$ (B) $1s^2, 2s^2 2p^2$ (C) $1s^2, 2s^2 2p^2, 3s^1$ (D) $1s^2, 2s^2 2p^5$

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Kapil Rana (IIT KGP)

Q.38 Which of the following anion has the smallest radius ?

(A) H^- (B) F^- (C) Cl^- (D) Br^-

“VKJ Series”

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Kapil Rana (IIT KGP)

Q.39 The ionic radii of Li^+ , Be^{2+} and B^{3+} follow the order :

(A) $\text{Be}^{2+} > \text{B}^{3+} > \text{Li}^+$

(B) $\text{Li}^+ > \text{B}^{3+} > \text{Be}^{2+}$

(C) $\text{B}^{3+} > \text{Be}^{2+} > \text{Li}^+$

(D) $\text{Li}^+ > \text{Be}^{2+} > \text{B}^{3+}$

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Kapil Rana (IIT KGP)

Q.40 Largest in size out of Na^+ , Ne and F^- is :

- (A) Na^+ (B) Ne (C) F^- (D) all are equal**

“VKJ Series”

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Kapil Rana (IIT KGP)

Q.41 Which of the following atom or ions has the smallest size ?

- (A) F (B) F⁻ (C) O (D) N**

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Kapil Rana (IIT KGP)

Q.42 The single covalent radius of P is 0.11 nm. The single covalent radius of Cl will be :

- (A) smaller than P (B) greater than P (C) same as P (D) twice of P**

“VKJ Series”

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Kapil Rana (IIT KGP)

Q.43 Which of the following is arranged in decreasing order of size ?



“VKJ Series”

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Kapil Rana (IIT KGP)

Q.44 The correct order of increasing atomic radius of the following elements is :

- (A) $S < O < Se < C$ (B) $O < C < S < Se$ (C) $O < S < Se < C$ (D) $C < O < S < Se$**

“VKJ Series”

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Kapil Rana (IIT KGP)

Q.45 The correct order of increasing radius of the elements Si, Al, Na and P is :

- (A) $\text{Si} < \text{Al} < \text{P} < \text{Na}$ (B) $\text{P} < \text{Si} < \text{Al} < \text{Na}$ (C) $\text{Al} < \text{Si} < \text{P} < \text{Na}$ (D) $\text{Al} < \text{P} < \text{Si} < \text{Na}$

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Kapil Rana (IIT KGP)

Q.46 The size of the species, Pb, Pb²⁺, Pb⁴⁺ decreases as :

(A) Pb⁴⁺ > Pb²⁺ > Pb (B) Pb > Pb²⁺ > Pb⁴⁺ (C) Pb > Pb⁴⁺ > Pb²⁺ (D) Pb⁴⁺ > Pb > Pb²⁺

“VKJ Series”

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Kapil Rana (IIT KGP)

Q.48 The correct order of atomic/ionic radii is :

(A) Sc > Ti > V > Cr

(B) Co > Ni > Cu > Zn

(C) S²⁻ > Cl⁻ > O²⁻ > N³⁻

(D) None of these

“VKJ Series”

**Use the referral Code : “KRSIR” for 10%
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Kapil Rana (IIT KGP)

Q.49 The radius of which ion is closest to that of Li^+ ion ?

(A) Na^+ (B) Be^{2+} (C) Mg^{2+} (D) Al^{3+}

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Q.50 The first, second and third ionisation energies (E_1 , E_2 and E_3) for an element are 7 eV, 12.5 eV and 42.5 eV respectively. The most stable oxidation state of the element will be :

(A) +1 (B) +4 (C) +3 (D) +2

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Q.51 Element having highest I.P. value is :

(A) Ne (B) He (C) Be (D) N

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Q.52 The order of ionisation potential between He^+ ion and H-atom (both species are in gaseous state) is :

- (A) I.P. (He^+) = I.P. (H) (B) I.P. (He^+) < I.P. (H)**
(C) I.P. (He^+) > I.P. (H) (D) cannot be compared

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Q.53 Which of the following metal is expected to have the highest third ionization enthalpy ?

(A) Cr (Z = 24)

(B) V (Z = 23)

(C) Mn (Z = 25)

(D) Fe (Z = 26)

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Thank
you!