

FINAL JEE-MAIN EXAMINATION – JANUARY, 2024

(Held On Monday 29th January, 2024)

TIME : 9 : 00 AM to 12 : 00 NOON

CHEMISTRY

TEST PAPER WITH SOLUTION

SECTION-A

61. Given below are two statements : one is labelled as **Assertion A** and the other is labelled as **Reason R**:
Assertion A: The first ionisation enthalpy decreases across a period.

Reason R: The increasing nuclear charge outweighs the shielding across the period.

In the light of the above statements, choose the most appropriate from the options given below:

- (1) Both A and R are true and R is the correct explanation of A
(2) A is true but R is false
(3) A is false but R is true
(4) Both A and R are true but R is NOT the correct explanation of A

Ans. (3)

Sol. First ionisation energy **increases** along the period. Along the period Z increases which outweighs the shielding effect

62. Match List I with List II

LIST-I (Substances)	LIST-II (Element Present)
A. Ziegler catalyst	I. Rhodium
B. Blood Pigment	II. Cobalt
C. Wilkinson catalyst	III. Iron
D. Vitamin B ₁₂	IV. Titanium

Choose the correct answer from the options given below:

- (1) A-II, B-IV, C-I, D-III
(2) A-II, B-III, C-IV, D-I
(3) A-III, B-II, C-IV, D-I
(4) A-IV, B-III, C-I, D-II

Ans. (4)

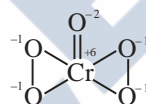
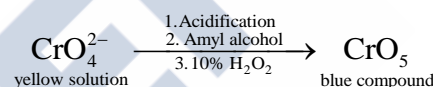
Sol. Ziegler catalyst → Titanium
Blood pigment → Iron
Wilkinson catalyst → Rhodium
Vitamin B₁₂ → Cobalt

63. In chromyl chloride test for confirmation of Cl⁻ ion, a yellow solution is obtained. Acidification of the solution and addition of amyl alcohol and 10% H₂O₂ turns organic layer blue indicating formation of chromium pentoxide. The oxidation state of chromium in that is

- (1)+6 (2)+5
(3)+10 (4)+3

Ans. (1)

Sol. $Cl^- + K_2Cr_2O_7 + H_2SO_4 \rightarrow CrO_2Cl_2 \xrightarrow{\text{Basic medium}} CrO_4^{2-} + Cl^-$
yellow solution



64. The difference in energy between the actual structure and the lowest energy resonance structure for the given compound is

- (1) electromeric energy
(2) resonance energy
(3) ionization energy
(4) hyperconjugation energy

Ans. (2)

Sol. The difference in energy between the actual structure and the lowest energy resonance structure for the given compound is known as resonance energy.

65. Given below are two statements :

Statement I : The electronegativity of group 14 elements from Si to Pb gradually decreases.

Statement II : Group 14 contains non-metallic, metallic, as well as metalloid elements.

In the light of the above statements, choose the most appropriate from the options given below :

- (1) Statement I is false but Statement II is true
(2) Statement I is true but Statement II is false
(3) Both Statement I and Statement II are true
(4) Both Statement I and Statement II are false

Ans. (1)



