

FINAL JEE-MAIN EXAMINATION – JANUARY, 2024

 (Held On Thursday 01st February, 2024)

TIME : 3 : 00 PM to 6 : 00 PM

CHEMISTRY

SECTION-A

61. The transition metal having highest 3rd ionisation enthalpy is :

- | | |
|--------|--------|
| (1) Cr | (2) Mn |
| (3) V | (4) Fe |

Ans. (2)

62. Given below are two statements :

Statement (I) : A π bonding MO has lower electron density above and below the inter-nuclear axis.

Statement (II) : The π^* antibonding MO has a node between the nuclei.

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

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

Ans. (3)

63. Given below are two statements : one is labelled as **Assertion (A)** and the other is labelled as **Reason (R)**.

Assertion (A) : In aqueous solutions Cr^{2+} is reducing while Mn^{3+} is oxidising in nature.

Reason (R) : Extra stability to half filled electronic configuration is observed than incompletely filled electronic configuration.

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

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

Ans. (1)

TEST PAPER WITH ANSWER

64. Match List - I with List - II.

List-I

(Reactants)

- (A) Phenol, Zn/Δ
- (B) Phenol, CHCl_3 , NaOH, HCl
- (C) Phenol, CO_2 , NaOH, HCl
- (D) Phenol, Conc. HNO_3

List-II

Products

- (I) Salicylaldehyde
- (II) Salicylic acid
- (III) Benzene
- (IV) Picric acid

Choose the correct answer from the options given below.

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

Ans. (3)

65. Given below are two statements :

Statement (I) : Both metal and non-metal exist in p and d-block elements.

Statement (II) : Non-metals have higher ionisation enthalpy and higher electronegativity than the metals.

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

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

Ans. (2)

66. The strongest reducing agent among the following is:

- | | |
|--------------------|--------------------|
| (1) NH_3 | (2) SbH_3 |
| (3) BiH_3 | (4) PH_3 |

Ans. (3)



67. Which of the following compounds show colour due to d-d transition?

- (1) $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ (2) $\text{K}_2\text{Cr}_2\text{O}_7$
(3) K_2CrO_4 (4) KMnO_4

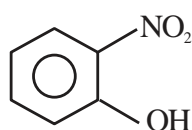
Ans. (1)

68. The set of meta directing functional groups from the following sets is:

- (1) $-\text{CN}$, $-\text{NH}_2$, $-\text{NHR}$, $-\text{OCH}_3$
(2) $-\text{NO}_2$, $-\text{NH}_2$, $-\text{COOH}$, $-\text{COOR}$
(3) $-\text{NO}_2$, $-\text{CHO}$, $-\text{SO}_3\text{H}$, $-\text{COR}$
(4) $-\text{CN}$, $-\text{CHO}$, $-\text{NHCOCH}_3$, $-\text{COOR}$

Ans. (3)

69. Select the compound from the following that will show intramolecular hydrogen bonding.

- (1) H_2O
(2) NH_3
(3) $\text{C}_2\text{H}_5\text{OH}$
(4) 

Ans. (4)

70. Lassaigne's test is used for detection of :

- (1) Nitrogen and Sulphur only
(2) Nitrogen, Sulphur and Phosphorous Only
(3) Phosphorous and halogens only
(4) Nitrogen, Sulphur, phosphorous and halogens

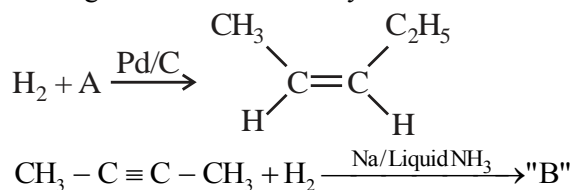
Ans. (4)

71. Which among the following has highest boiling point?

- (1) $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_3$
(2) $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{OH}$
(3) $\text{CH}_3\text{CH}_2\text{CH}_2\text{CHO}$
(4) $\text{H}_3\text{C}_2 - \text{O} - \text{C}_2\text{H}_5$

Ans. (2)

72. In the given reactions identify A and B.



- (1) A : 2-Pentyne B : trans - 2 - butene
(2) A : n - Pentane B : trans - 2 - butene
(3) A : 2 - Pentyne B : Cis - 2 - butene
(4) A : n - Pentane B : Cis - 2 - butene

Ans. (1)

73. The number of radial node/s for 3p orbital is:

- (1) 1 (2) 4
(3) 2 (4) 3

Ans. (1)

74. Match List - I with List - II.

List - I Compound	List - II Use
(A) Carbon tetrachloride	(I) Paint remover
(B) Methylene chloride	(II) Refrigerators and air conditioners
(C) DDT	(III) Fire extinguisher
(D) Freons	(IV) Non Biodegradable insecticide

Choose the correct answer from the options given below :

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

Ans. (2)

75. The functional group that shows negative resonance effect is:

- (1) $-\text{NH}_2$ (2) $-\text{OH}$
(3) $-\text{COOH}$ (4) $-\text{OR}$

Ans. (3)

76. $[\text{Co}(\text{NH}_3)_6]^{3+}$ and $[\text{CoF}_6]^{3-}$ are respectively known as:

- (1) Spin free Complex, Spin paired Complex
(2) Spin paired Complex, Spin free Complex
(3) Outer orbital Complex, Inner orbital Complex
(4) Inner orbital Complex, Spin paired Complex

Ans. (2)



77. Given below are two statements :

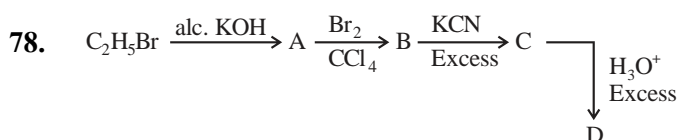
Statement (I) : SiO_2 and GeO_2 are acidic while SnO and PbO are amphoteric in nature.

Statement (II) : Allotropic forms of carbon are due to property of catenation and $p\pi-d\pi$ bond formation.

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

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

Ans. (3)



Acid D formed in above reaction is :

- (1) Gluconic acid
- (2) Succinic acid
- (3) Oxalic acid
- (4) Malonic acid

Ans. (2)

79. Solubility of calcium phosphate (molecular mass, M) in water is W_g per 100 mL at 25°C . Its solubility product at 25°C will be approximately.

- (1) $10^7 \left(\frac{W}{M} \right)^3$
- (2) $10^7 \left(\frac{W}{M} \right)^5$
- (3) $10^3 \left(\frac{W}{M} \right)^5$
- (4) $10^5 \left(\frac{W}{M} \right)^5$

Ans. (2)

80. Given below are two statements :

Statement (I) : Dimethyl glyoxime forms a six-membered covalent chelate when treated with NiCl_2 solution in presence of NH_4OH .

Statement (II) : Prussian blue precipitate contains iron both in (+2) and (+3) oxidation states. In the light of the above statements, choose the most appropriate answer from the options given below:

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

Ans. (1)

SECTION-B

81. Total number of isomeric compounds (including stereoisomers) formed by monochlorination of 2-methylbutane is _____.

Ans. (6)

82. The following data were obtained during the first order thermal decomposition of a gas A at constant volume:



S.No	Time/s	Total pressure/(atm)
1.	0	0.1
2.	115	0.28

The rate constant of the reaction is _____ $\times 10^{-2}\text{s}^{-1}$ (nearest integer)

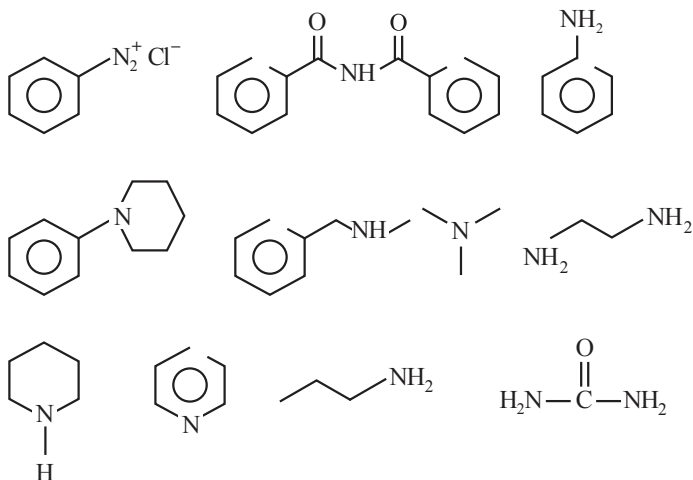
Ans. (2)

83. The number of tripeptides formed by three different amino acids using each amino acid once is _____.

Ans. (6)



84. Number of compounds which give reaction with Hinsberg's reagent is _____.



Ans. (5)

85. Mass of ethylene glycol (antifreeze) to be added to 18.6 kg of water to protect the freezing point at -24°C is _____ kg (Molar mass in g mol^{-1} for ethylene glycol 62, K_f of water = $1.86 \text{ K kg mol}^{-1}$)

Ans. (15)

86. Following Kjeldahl's method, 1g of organic compound released ammonia, that neutralised 10 mL of 2M H_2SO_4 . The percentage of nitrogen in the compound is _____ %.

Ans. (56)

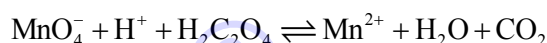
87. The amount of electricity in Coulomb required for the oxidation of 1 mol of H_2O to O_2 is _____ $\times 10^5 \text{C}$.

Ans. (2)

88. For a certain reaction at 300K, $K = 10$, then ΔG° for the same reaction is _____ $\times 10^{-1} \text{ kJ mol}^{-1}$. (Given $R = 8.314 \text{ JK}^{-1} \text{ mol}^{-1}$)

Ans. (57)

89. Consider the following redox reaction :



The standard reduction potentials are given as below (E_{red}°)

$$E_{\text{MnO}_4^-/\text{Mn}^{2+}}^{\circ} = +1.51\text{V}$$

$$E_{\text{CO}_2/\text{H}_2\text{C}_2\text{O}_4}^{\circ} = -0.49\text{V}$$

If the equilibrium constant of the above reaction is given as $K_{\text{eq}} = 10^x$, then the value of $x =$ _____ (nearest integer)

Ans. (338 OR 339)

90. 10 mL of gaseous hydrocarbon on combustion gives 40 mL of $\text{CO}_2(\text{g})$ and 50 mL of water vapour. Total number of carbon and hydrogen atoms in the hydrocarbon is _____.

Ans. (14)

ALLEN AI POWERED APP

- Personalized Study Plan
- Live Interactive Classes
- Adaptive Quizzes
- Doubt-Solving Sessions
- Many More

Free Crash Courses
for Class 10th | NEET | JEE

Ecology and Environment
Solves in last 2 weeks
Solve for 100% accuracy

95% improvement
Good progress in speed of problem solving

PHYSICS
Electric charge
A diagram representing alternating current and voltage (of the same frequency) as vectors (phasor) with the phase angle between them is called a phasor diagram. A diagram representing alternating current and...

SCALE UP YOUR **SCORE**!

with **ALLEN SCORE** TEST PAPERS



Total 10 Full
syllabus papers



Paper Analysis of
JEE Advanced 2023



By **ALLEN**
Subject Experts



Answer key
with Solutions

Scan **QR** to Buy

