

JEE Main April 2024
Question Paper With Text Solution
04 April | Shift-2

CHEMISTRY



JEE Main & Advanced | XI-XII Foundation | VI-X Pre-Foundation

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61. The number of unpaired d-electrons in $[\text{Co}(\text{H}_2\text{O})_6]^{3+}$ is _____.
- (1) 4 (2) 1 (3) 2 (4) 0

Question ID: 68019113863

Ans. Official Answer by NTA (4)

Sol.

62. The correct statement/s about Hydrogen bonding is/are
- A. Hydrogen bonding exists when H is covalently bonded to the highly electro negative atom.
- B. Intermolecular H bonding is present in o-nitro phenol
- C. Intramolecular H bondine is present in HF.
- D. The magnitude of H bonding depends on the physical state of the compound.
- E. H-bonding has powerful effect on the structure and properties of compounds

Choose the **correct** answer from the options given below:

- (1) A only (2) A, D, E only (3) A, B, C only (4) A, B, D only

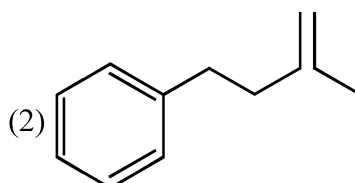
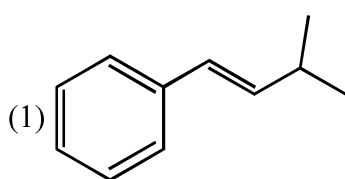
Question ID: 68019113855

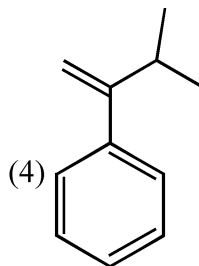
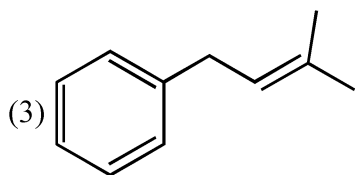
Ans. Official Answer by NTA (2)

Sol.

63.  major product "P"

Product P is





Question ID: 68019113870

Ans. Official Answer by NTA(1)

Sol.

64. Common name of Benzene - 1, 2 - diol is -

- (1) resorcinol (2) catechol (3) o-cresol (4) quinol

Question ID: 68019113871

Ans. Official Answer by NTA(2)

Sol.

65. The adsorbent used in adsorption chromatography is/are -

- A. Silica gel
B. Alumina
C. Quick lime
D. Magnesia

Choose the **most appropriate** answer from the options given below :

- (1) A and B only (2) C and D only (3) B only (4) A only

Question ID: 68019113866

Ans. Official Answer by NTA(1)

Sol.

66. Match List I with List II

- | | |
|--|-----------------------|
| A. α - Glucose and α - Galactose | I. Functional isomers |
| B. α - Glucose and β - Glucose | II. Homologous |
| C. α - Glucose and α - Fructose | III. Anomers |
| D. α - Glucose and α - Ribose | IV. Epimers |

Choose the **correct** answer from the options given below :

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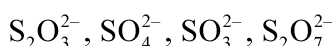
- (1) A-III, B-IV, C-II, D-I
(2) A-IV, B-III, C-I, D-II
(3) A-IV, B-III, C-II, D-I
(4) A-III, B-IV, C-I, D-II

Question ID: 68019113873

Ans. Official Answer by NTA(2)

Sol.

67. The number of species from the following that have pyramidal geometry around the central atom is _____



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

Question ID: 68019113861

Ans. Official Answer by NTA(2)

Sol.

68. Choose the Incorrect statement about Dalton's Atomic Theory

- (1) Matter consists of indivisible atoms.
(2) Chemical reactions involve reorganization of atoms
(3) All the atoms of a given element have identical properties including identical mass.
(4) Compounds are formed when atoms of different elements combine in any ratio.

Question ID: 68019113854

Ans. Official Answer by NTA(4)

Sol.

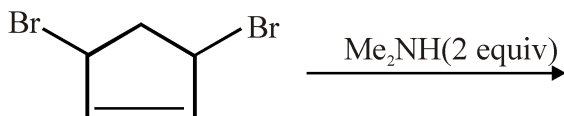
69. The correct order of the first ionization enthalpy is

- (1) $B > Al > Ga$ (2) $Ga > Al > B$ (3) $Tl > Ga > Al$ (4) $Al > Ga > Tl$

Question ID: 68019113860

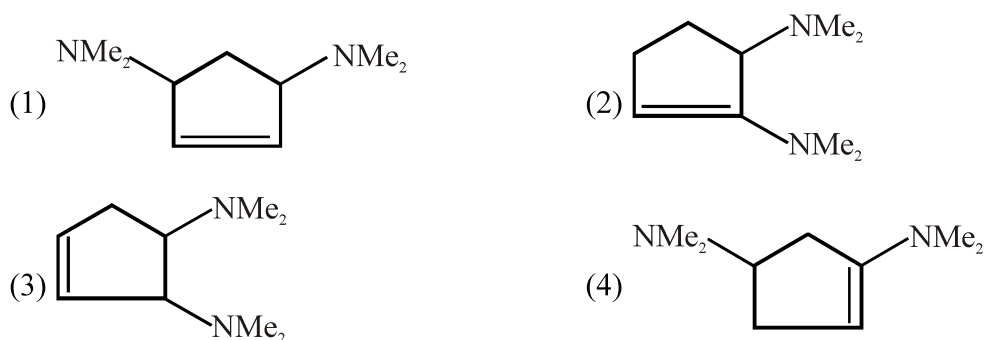
Ans. Official Answer by NTA(3)

Sol.

70. Find out the major product formed from the following reaction. [Me : $-\text{CH}_3$]**MATRIX JEE ACADEMY**

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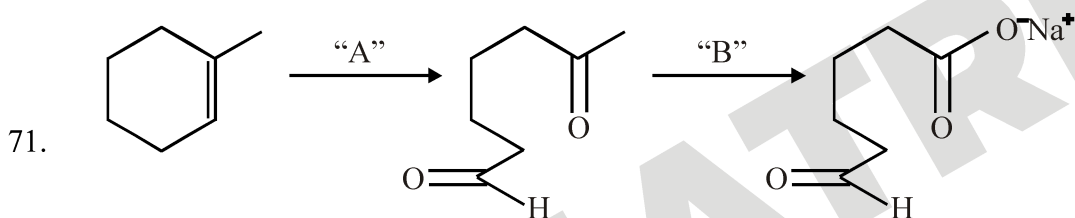
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Question ID: 68019113869

Ans. Official Answer by NTA (3)

Sol.



In the above chemical reaction sequence "A" and "B" respectively are

- (1) H_2O , H^+ and KMnO_4 (2) O_3 , $\text{Zn}/\text{H}_2\text{O}$ and $\text{NaOH}_{(\text{alc})}/\text{I}_2$
 (3) O_3 , $\text{Zn}/\text{H}_2\text{O}$ and KMnO_4 (4) H_2O , H^+ and $\text{NaOH}_{(\text{alc})}/\text{I}_2$

Question ID: 68019113868

Ans. Official Answer by NTA (2)

Sol.

72. A first row transition metal in its +2 oxidation state has a spin-only magnetic moment value of 3.86 BM. The atomic number of the metal is

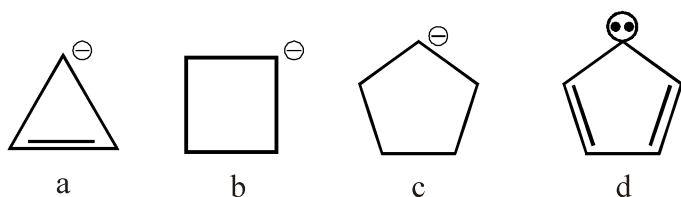
- (1) 22 (2) 23 (3) 25 (4) 26

Question ID: 68019113862

Ans. Official Answer by NTA (2)

Sol.

73. Correct order of stability of carbonion is -



- (1) $d > a > c > b$ (2) $c > b > d > a$ (3) $d > c > b > a$ (4) $a > b > c > d$

Question ID: 68019113867

Ans. Official Answer by NTA (3)

Sol.

74. Given below are two statements :

Statement-I : The correct order of first ionization enthalpy values of Li, Na, F and Cl is $\text{Na} < \text{Li} < \text{Cl} < \text{F}$.

Statement-II : The correct order of negative electron gain enthalpy values of Li, Na, F and Cl is $\text{Na} < \text{Li} < \text{F} < \text{Cl}$

In the light of the above statements, choose the **correct** answer from the options given below:

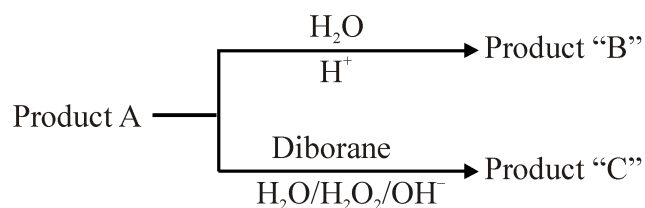
- (1) Statement I is false but Statement II is true
 (2) Both Statement I and Statement II is false
 (3) Statement I is true but Statement II is false
 (4) Both Statement I and Statement II is true

Question ID: 68019113859

Ans. Official Answer by NTA (4)

Sol.

75. $\text{CH}_3 - \text{CH}_2 - \text{CH}_2 - \text{Br} + \text{NaOH} \xrightarrow{\text{C}_2\text{H}_5\text{OH}}$ Product 'A'





Consider the above reactions, identify product B and product C.

- (1) B = C = 2-Propanol
(2) B = C = 1-Propanol
(3) B = 2-Propanol C = 1-Propanol
(4) B = 1-Propanol C = 2-Propanol

Question ID: 68019113872

Ans. Official Answer by NTA(3)

Sol.

76. When MnO_2 and H_2SO_4 is added to a salt (A), the greenish yellow gas liberated as salt (A) is :

- (1) NaBr (2) CaI_2 (3) KNO_3 (4) NH_4Cl

Question ID: 68019113865

Ans. Official Answer by NTA(4)

Sol.

77. Fuel cell, using hydrogen and oxygen as fuels,

- A. has been used in spaceship
B. has as efficiency of 40% to produce electricity
C. uses aluminum as catalysts
D. is eco-friendly
E. is actually a type of Galvanic cell only

Choose the **correct** answer from the options given below:

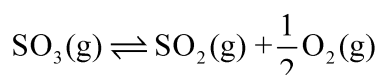
- (1) A, B, C only (2) A, B, D, E only (3) A, B, D only (4) A, D, E only

Question ID: 68019113857

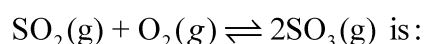
Ans. Official Answer by NTA(4)

Sol.

78. The equilibrium constant for the reaction



is $K_c = 4.9 \times 10^{-2}$. The value of K_c for the reaction given below is





(1) 49

(2) 4.9

(3) 416

(4) 41.6

Question ID: 68019113856

Ans. Official Answer by NTA(3)

Sol.

79. For a strong electrolyte, a plot of molar conductivity against (concentration)^{1/2} is a straight line, with a negative slope, the correct unit for the slope is

(1) S cm² mol⁻¹ L^{1/2}(2) S cm² mol^{-3/2} L^{1/2}(3) S cm² mol^{-3/2} L(4) S cm² mol^{-3/2} L^{-1/2}

Question ID: 68019113858

Ans. Official Answer by NTA(2)

Sol.

80. If an iron (III) complex with the formula $[\text{Fe}(\text{NH}_3)_x(\text{CN})_y]^-$ has no electron in its e_g orbital, then the value of x + y is

(1) 3

(2) 6

(3) 5

(4) 4

Question ID: 68019113864

Ans. Official Answer by NTA(2)

Sol.

81. From 6.55 g of aniline, the maximum amount of acetanilide that can be prepared will be _____ × 10⁻¹ g.

Question ID: 68019113880

Ans. Official Answer by NTA(95)

Sol.

82. Number of compounds/species from the following with non-zero dipole moment is _____.

BeCl₂, BCl₃, NF₃, XeF₄, CCl₄, H₂O, H₂S, HBr, CO₂, H₂, HCl

Question ID: 68019113875

Ans. Official Answer by NTA(5)

Sol.

83. A first row transition metal with highest enthalpy of atomisation, upon reaction with oxygen at high temperature forms oxides of formula M₂O_n (where n = 3, 4, 5). The 'spin-only' magnetic moment value of the amphoteric oxide from the above oxides is _____ BM (near integer)

(Given atomic number: Sc : 21, Ti : 22, V : 23, Cr : 24, Mn : 25, Fe : 26, Co : 27,



Ni : 28, Cu : 29, Zn : 30)

Question ID: 68019113879

Ans. Official Answer by NTA (0)

Sol.

84. The maximum number of orbitals which can be identified with $n = 4$ and $m_l = 0$ is _____.

Question ID: 68019113874

Ans. Official Answer by NTA (4)

Sol.

85. Consider the following reaction, the rate expression of which is given below



$$\text{rate} = k[A]^{1/2} [B]^{1/2}$$

The reaction is initiated by taking 1 M concentration of A and B each. If the rate constant (k) is $4.6 \times 10^{-2} \text{ s}^{-1}$, then the time taken for A to become 0.1 M is _____ sec. (nearest integer)

Question ID: 68019113878

Ans. Official Answer by NTA (50)

Sol.

86. 2.7 kg of each of water and acetic acid are mixed. The freezing point of The solution will be $-x \text{ }^\circ\text{C}$. Consider the acetic acid does not dimerise in water, nor dissociates in water. $x =$ _____ (nearest integer)

[Given: Molar mass of water = 18 g mol^{-1} , acetic acid = 60 g mol^{-1}

$$K_f \text{ H}_2\text{O} : 1.86 \text{ K kg mol}^{-1}$$

$$K_f \text{ acetic acid} : 3.90 \text{ K kg mol}^{-1}$$

$$\text{freezing point} : \text{H}_2\text{O} = 273 \text{ K, acetic acid} = 290 \text{ K}]$$

Question ID: 68019113877

Ans. Official Answer by NTA (31)

Sol.

87. Vanillin compound obtained from vanilla beans, has total sum of oxygen atoms and π electrons is _____.

Question ID: 68019113882

Ans. Official Answer by NTA (11)

Answer by Matrix is (15)



Sol.

88. The total number of 'sigma' and 'Pi' bonds in 2-oxohex-4-ynoic acid is _____.

Question ID: 68019113881

Ans. Official Answer by NTA (18)

Sol.

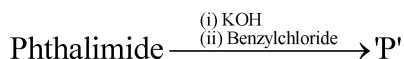
89. Three moles of an ideal gas are compressed isothermally from 60 L to 20 L using constant pressure of 5 atm. Heat exchange Q for compression is _____ Lit. atm.

Question ID: 68019113876

Ans. Official Answer by NTA (200)

Sol.

90. Phthalimide is made to undergo following sequence of reactions.



Total number of π bonds present in product 'P' is/are _____.

Question ID: 68019113883

Ans. Official Answer by NTA (8)

Sol.