Chemistry Section A

Section Id :	708191792
Section Number :	3
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	20
Number of Questions to be attempted :	20
Section Marks :	80
Mark As Answered Required? :	Yes
Sub-Section Number :	1
Sub-Section Id :	7081911072
Question Shuffling Allowed :	Yes

Question Number : 31 Question Id : 70819118784 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Which among the following species has unequal bond lengths ?

Options :

70819161501. XeF_4

70819161502. SiF_4

70819161503. SF_4

70819161504. $BF_4{}^-$

Question Number : 32 Question Id : 70819118785 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The solubility of $Ca(OH)_2$ in water is :
[Given : The solubility product of $Ca(OH)_2$ in water $= 5.5 \times 10^{-6}$]

Options :

70819161505. 1.11×10^{-2}

70819161506. 1.11×10^{-6}

70819161507. 1.77×10^{-2}

70819161508. 1.77×10^{-6}

Question Number : 33 Question Id : 70819118786 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Which one of the following statements is FALSE for hydrophilic sols ?

Options :

70819161509. They do not require electrolytes for stability.

70819161510. These sols are reversible in nature.

70819161511. Their viscosity is of the order of that of H_2O.

70819161512. The sols cannot be easily coagulated.

Question Number : 34 Question Id : 70819118787 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The correct order of bond dissociation enthalpy of halogens is :

Options :

70819161513. $F_2 > Cl_2 > Br_2 > I_2$

70819161514. $I_2 > Br_2 > Cl_2 > F_2$

70819161515. $Cl_2 > Br_2 > F_2 > I_2$

70819161516. $Cl_2 > F_2 > Br_2 > I_2$

Question Number : 35 Question Id : 70819118788 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The method used for the purification of Indium is :

Options :

70819161517. van Arkel method

70819161518. liquation

70819161519. zone refining

70819161520. vapour phase refining

Question Number : 36 Question Id : 70819118789 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Water does not produce CO on reacting with :

Options :

70819161521. CH_4

70819161522. C

70819161523. CO_2

70819161524. C_3H_8

Question Number : 37 Question Id : 70819118790 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Given below are two statements :

Statement I :

α and β forms of sulphur can change reversibly between themselves with slow heating or slow cooling.

Statement II :

At room temperature the stable crystalline form of sulphur is monoclinic sulphur.

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

Options :

70819161525. Both Statement I and Statement II are true.

70819161526. Both Statement I and Statement II are false.

70819161527. Statement I is true but Statement II is false.

70819161528. Statement I is false but Statement II is true.

Question Number : 38 Question Id : 70819118791 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The major components of German Silver are :

Options :

70819161529. Cu, Zn and Ag

70819161530. Cu, Zn and Ni

70819161531. Ge, Cu and Ag

70819161532. Zn, Ni and Ag

Question Number : 39 Question Id : 70819118792 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

In which of the following order the given complex ions are arranged correctly with respect to their decreasing spin only magnetic moment ?

(i) $[FeF_6]^{3-}$ (ii) $[Co(NH_3)_6]^{3+}$ (iii) $[NiCl_4]^{2-}$ (iv) $[Cu(NH_3)_4]^{2+}$

Options :

70819161533. (i) > (iii) > (iv) > (ii)

70819161534. (ii) > (iii) > (i) > (iv)

70819161535. (iii) > (iv) > (ii) > (i)

70819161536. (ii) > (i) > (iii) > (iv)

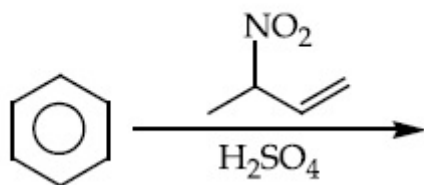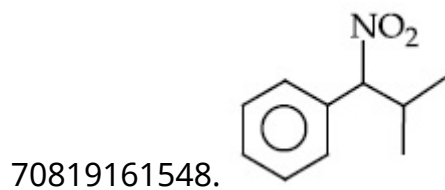**Question Number : 40 Question Id : 70819118793 Question Type : MCQ Option Shuffling : Yes**

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Given below are two statements :

Statement I :

The pH of rain water is normally ~5.6.

Statement II :

If the pH of rain water drops below 5.6, it is called acid rain.

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

Options :

70819161537. Both Statement I and Statement II are true.

70819161538. Both Statement I and Statement II are false.

70819161539. Statement I is true but Statement II is false.

70819161540. Statement I is false but Statement II is true.

Question Number : 41 Question Id : 70819118794 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Which of the following compound is added to the sodium extract before addition of silver nitrate for testing of halogens ?

Options :

70819161541. Hydrochloric acid

70819161542. Sodium hydroxide

70819161543. Nitric acid

70819161544. Ammonia

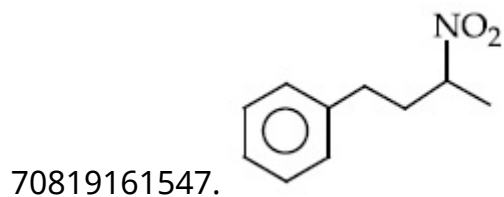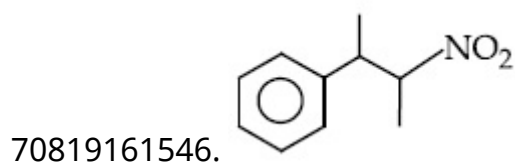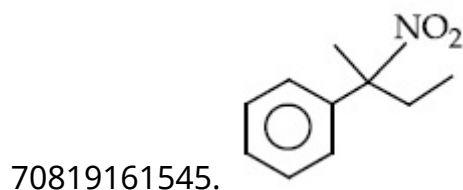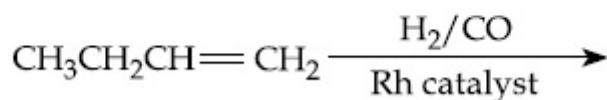**Question Number : 42 Question Id : 70819118795 Question Type : MCQ Opt**

Correct Marks : 4 Wrong Marks : 1

The major product of the following reaction is :

Options :

70819161545.

70819161546.

70819161547.

70819161548.

Question Number : 43 Question Id : 70819118796 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The major product of the following reaction is :

$$CH_3CH_2CH = CH_2 \xrightarrow[\text{Rh catalyst}]{H_2/CO}$$

Options :

70819161549. $CH_3CH_2CH_2CH_2CHO$

70819161550. $CH_3CH_2CH_2CHO$

70819161551. $CH_3CH_2CH = CH - CHO$

70819161552. $CH_3CH_2C = CH_2$
$\quad\quad\quad\quad\quad |$
$\quad\quad\quad\quad CHO$

Question Number : 44 Question Id : 70819118797 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The correct sequence of reagents used in the preparation of 4-bromo-2-nitroethyl benzene from benzene is :

Options :

70819161553. $CH_3COCl/AlCl_3, Br_2/AlBr_3, HNO_3/H_2SO_4, Zn/HCl$

70819161554. $CH_3COCl/AlCl_3, Zn-Hg/HCl, Br_2/AlBr_3, HNO_3/H_2SO_4$

70819161555. $Br_2/AlBr_3, CH_3COCl/AlCl_3, HNO_3/H_2SO_4, Zn/HCl$

70819161556. $HNO_3/H_2SO_4, Br_2/AlCl_3, CH_3COCl/AlCl_3, Zn-Hg/HCl$

Question Number : 45 Question Id : 70819118798 Question Type : MCQ Option Shuffling : Yes

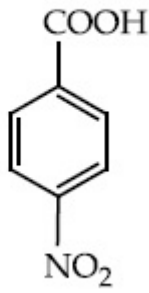**Is Question Mandatory : No**

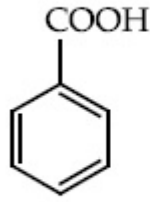**Correct Marks : 4 Wrong Marks : 1**

The correct order of acid character of the following compounds is :
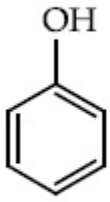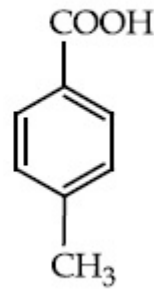

I   II   III   IV

Options :

70819161557. I > II > III > IV

70819161558. III > II > I > IV
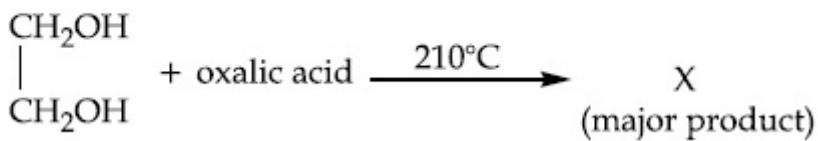
70819161559. II > III > IV > I

70819161560. IV > III > II > I

Question Number : 46 Question Id : 70819118799 Question Type : MCQ Option Shuffling : Yes
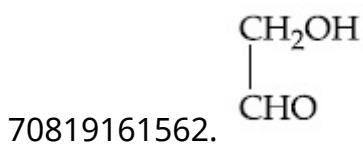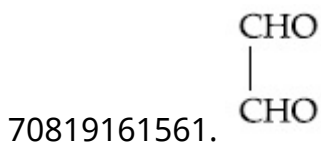
Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

What is 'X' in the given reaction ?

$$\begin{array}{c} CH_2OH \\ | \\ CH_2OH \end{array} + \text{oxalic acid} \xrightarrow{210°C} \begin{array}{c} X \\ \text{(major product)} \end{array}$$

Options :

70819161561.
$$\begin{array}{c} CHO \\ | \\ CHO \end{array}$$

70819161562.
$$\begin{array}{c} CH_2OH \\ | \\ CHO \end{array}$$

70819161563.
$$\begin{array}{c} CH_2 \\ \parallel \\ CH_2 \end{array}$$

70819161564.
$$\begin{array}{c} CH-OH \\ \parallel \\ CH_2 \end{array}$$

Question Number : 47 Question Id : 70819118800 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Correct statement about the given chemical reaction is :

Options :

70819161565. $\overset{..}{-NH_2}$ group is *ortho* and *para* directive, so product (B) is not possible.

70819161566. Reaction is possible and compound (B) will be the major product.

70819161567. The reaction will form sulphonated product instead of nitration.

70819161568. Reaction is possible and compound (A) will be major product.

Question Number : 48 Question Id : 70819118801 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Carbylamine test is used to detect the presence of primary amino group in an organic compound. Which of the following compound is formed when this test is performed with aniline ?
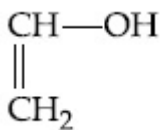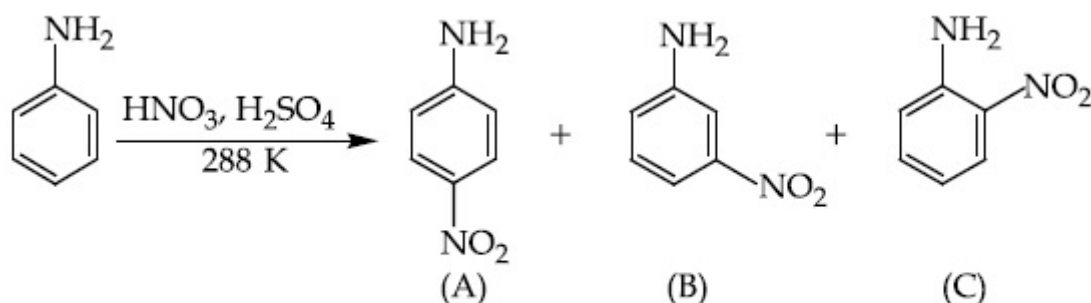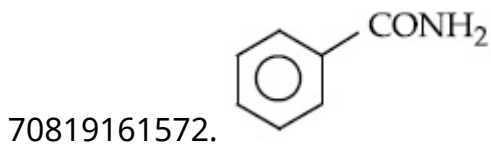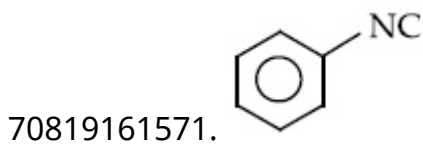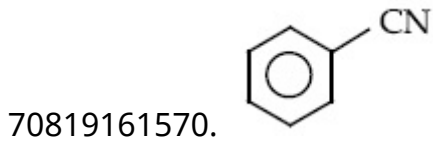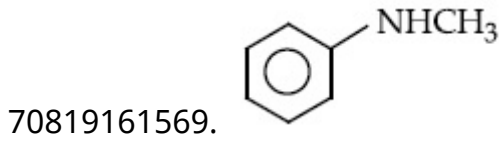
Options :

70819161569.

70819161570.

70819161571.

70819161572.

Question Number : 49 Question Id : 70819118802 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Which of the following is correct structure of α-anomer of maltose ?

Options :

70819161573.

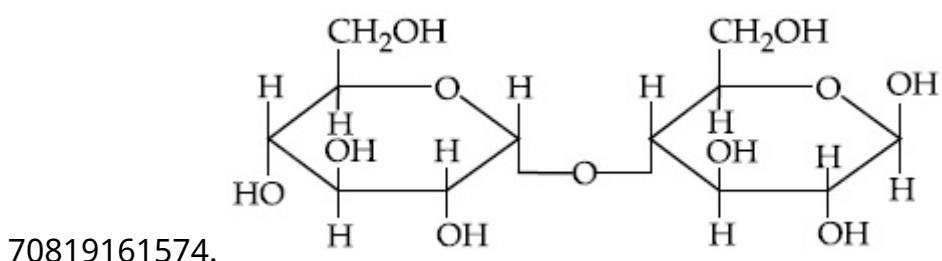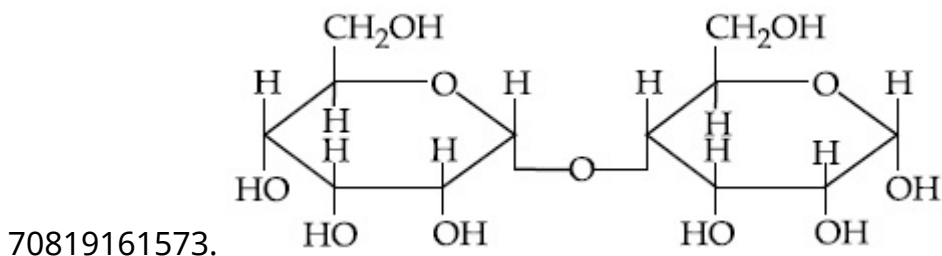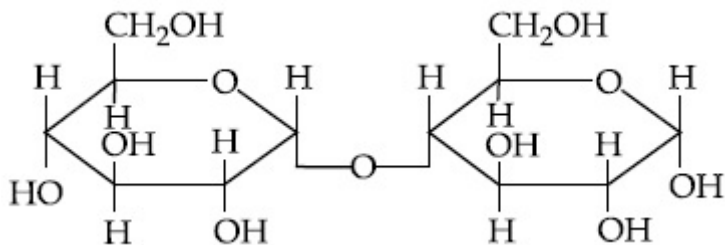70819161574.
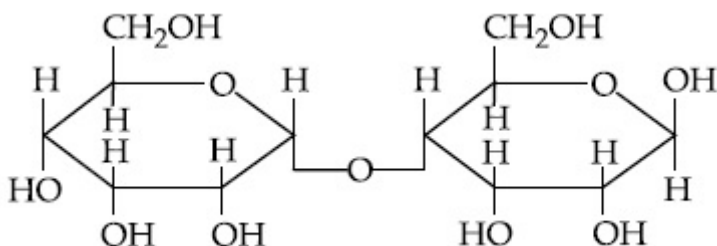
70819161575.

70819161576.

Question Number : 50 Question Id : 70819118803 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Given below are two statements :

Statement I :

The identification of Ni^{2+} is carried out by dimethyl glyoxime in the presence of NH_4OH.

Statement II :

The dimethyl glyoxime is a bidentate neutral ligand.

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

Options :

70819161577. Both Statement I and Statement II are true.

70819161578. Both Statement I and Statement II are false.

70819161579. Statement I is true but Statement II is false.

70819161580. Statement I is false but Statement II is true.

Chemistry Section B

Section Id : 708191793

Section Number : 4

Section type : Online

Mandatory or Optional : Mandatory

Number of Questions : 10

Number of Questions to be attempted : 5

Section Marks : 20

Mark As Answered Required? : Yes

Sub-Section Number : 1

Sub-Section Id : 7081911073

Question Shuffling Allowed : Yes

Question Number : 51 Question Id : 70819118804 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

Consider titration of NaOH solution versus 1.25 M oxalic acid solution. At the end point following burette readings were obtained.

(i) 4.5 mL   (ii) 4.5 mL   (iii) 4.4 mL

(iv) 4.4 mL   (v) 4.4 mL

If the volume of oxalic acid taken was 10.0 mL then the molarity of the NaOH solution is _____ M. (Rounded-off to the nearest integer)

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 52 Question Id : 70819118805 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

The unit cell of copper corresponds to a face centered cube of edge length 3.596 Å with one copper atom at each lattice point. The calculated density of copper in kg/m³ is _____.
[Molar mass of Cu : 63.54 g ; Avogadro Number = 6.022×10^{23}]

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 53 Question Id : 70819118806 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

Electromagnetic radiation of wavelength 663 nm is just sufficient to ionise the atom of metal A. The ionization energy of metal A in kJ mol⁻¹ is _____. (Rounded-off to the nearest integer)
[h = 6.63×10^{-34} Js, c = 3.00×10^{8} ms⁻¹, N_A = 6.02×10^{23} mol⁻¹]

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 54 Question Id : 70819118807 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

Five moles of an ideal gas at 293 K is expanded isothermally from an initial pressure of 2.1 MPa to 1.3 MPa against at constant external pressure 4.3 MPa. The heat transferred in this process is _____ kJ mol⁻¹. (Rounded-off to the nearest integer)
[Use R = 8.314 J mol⁻¹K⁻¹]

Response Type : Numeric

Evaluation Required For SA : Yes

Question Number : 55 Question Id : 70819118808 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

If a compound AB dissociates to the extent of 75% in an aqueous solution, the molality of the solution which shows a 2.5 K rise in the boiling point of the solution is _____ molal. (Rounded-off to the nearest integer)
[$K_b = 0.52$ K kg mol^{-1}]

Response Type : Numeric

Evaluation Required For SA : Yes

Question Number : 56 Question Id : 70819118809 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

Copper reduces NO_3^- into NO and NO_2 depending upon the concentration of HNO_3 in solution. (Assuming fixed $[Cu^{2+}]$ and $P_{NO} = P_{NO_2}$), the HNO_3 concentration at which the thermodynamic tendency for reduction of NO_3^- into NO and NO_2 by copper is same is 10^x M. The value of $2x$ is _____. (Rounded-off to the nearest integer)

[Given, $E^o_{Cu^{2+}/Cu} = 0.34$ V, $E^o_{NO_3^-/NO} = 0.96$ V, $E^o_{NO_3^-/NO_2} = 0.79$ V and at 298 K,

$\frac{RT}{F}(2.303) = 0.059$]

Response Type : Numeric

Evaluation Required For SA : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 57 Question Id : 70819118810 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

The rate constant of a reaction increases by five times on increase in temperature from $27^{\circ}C$ to $52^{\circ}C$. The value of activation energy in kJ mol^{-1} is _____. (Rounded-off to the nearest integer)

$[R = 8.314 \text{ J K}^{-1} \text{ mol}^{-1}]$

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 58 Question Id : 70819118811 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

Among the following, number of metal/s which can be used as electrodes in the photoelectric cell is _____. (Integer answer)

(A) Li   (B) Na   (C) Rb   (D) Cs

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 59 Question Id : 70819118812 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

The spin only magnetic moment of a divalent ion in aqueous solution (atomic number 29) is _____ BM.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 60 Question Id : 70819118813 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

The number of compound/s given below which contain/s —COOH group is _____.
(Integer answer)
(A) Sulphanilic acid   (B) Picric acid
(C) Aspirin   (D) Ascorbic acid

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001