Chemistry Section A

Section Id :	67603393
Section Number :	3
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	20
Number of Questions to be attempted :	20
Section Marks :	80
Enable Mark as Answered Mark for Review and Clear Response :	Yes
Sub-Section Number :	1
Sub-Section Id :	67603393
Question Shuffling Allowed :	Yes

Question Number : 31 Question Id : 6760331381 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

Given below are two statements :

Statement I : In dichromate ion, all the Cr—O bonds are of equal length.

Statement II : In dichromate ion, the Cr–O–Cr bond angle is less than the H—O—H bond angle in water

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

Options :

6760334141. Both Statement I and Statement II are true

6760334142. Both Statement I and Statement II are false

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6760334143. Statement I is true but Statement II is false

6760334144. Statement I is false but Statement II is true

Question Number : 32 Question Id : 6760331382 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

The lowest freezing point among the following solutions will be observed in

[Atomic weight : C = 12, Mg = 24, Na = 23, Cl = 35.5, O = 16, N = 14]

Options :

6760334145. 5.85g of NaCl in 500 mL water

6760334146. 6g urea in 500 mL water

6760334147. 18g of glucose in 500 mL water

6760334148. 9.5g of $MgCl_2$ in 500 mL water

Question Number : 33 Question Id : 6760331383 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

The correct order of the basic character for the following metal hydroxides is

Options :

6760334149. $Al(OH)_3 > Ca(OH)_2 > Ce(OH)_3 > Lu(OH)_3$

6760334150. $Ca(OH)_2 > Ce(OH)_3 > Al(OH)_3 > Lu(OH)_3$

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6760334151. $Ca(OH)_2 > Ce(OH)_3 > Lu(OH)_3 > Al(OH)_3$

6760334152. $Lu(OH)_3 > Al(OH)_3 > Ce(OH)_3 > Ca(OH)_2$

Question Number : 34 Question Id : 6760331384 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

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

Assertion A : Fluoride based compound is added during extraction of aluminum from bauxite.

Reason R : Alumina is a poor conductor of electricity.

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

Options :

6760334153. Both A and R are true and R is the correct explanation of A

6760334154. Both A and R are true but R is NOT the correct explanation of A

6760334155. A is true but R is false

6760334156. A is false but R is true.

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Question Number : 35 Question Id : 6760331385 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

Which one of the following statements is incorrect?

A. The correct order of increasing first ionization enthalpy is Li < H < F.

B. Out of the three isotopes of hydrogen, two are radioactive

C. Reactivity of halogens is much more than that of hydrogen.

D. The size of H^+ ion is less than 0.1 pm.

Options :

6760334157. A only

6760334158. B only

6760334159. C only

6760334160. D only

Question Number : 36 Question Id : 6760331386 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

A white solid (X) on heating forms a solid (Y) and a gas (Z). Another solid (B) forms (X) by reacting with (Z). (Y) can be converted into (X) and (B). What is (Y)?

Options :

6760334161. $CaCO_3$

6760334162. CaO

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6760334163. $Ca(OH)_2$

6760334164. $CaCl_2$.

Question Number : 37 Question Id : 6760331387 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

Silicones are group of organosilicon polymers. Which one among the following acts as a chain terminating unit in silicone polymerization?

Options :

6760334165. $Si(CH_3)_4$

6760334166. $Si(CH_3)_3Cl$

6760334167. $Si(CH_3)_2Cl_2$

6760334168. $Si(CH_3)Cl_3$

Question Number : 38 Question Id : 6760331388 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

Which one of the following set will give coloured aqueous solution?

Options :

6760334169. Cu^{2+}, V^{3+}, Sc^{3+}

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6760334170. Sc^{3+}, Ti^{4+}, Mn^{3+}

6760334171. V^{3+}, Mn^{3+}, Cu^{2+}

6760334172. V^{3+}, Cu^{2+}, Ti^{4+}

Question Number : 39 Question Id : 6760331389 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

Which one of the following statements is correct?

Options :

6760334173. Ce^{4+} is more stable than Ce^{3+} due to $4f^0$ configuration.

6760334174. Eu^{2+} is more stable than Eu^{3+} due to $4f^7$ configuration.

6760334175. Ce^{4+} is an oxidant and Eu^{2+} is a reducing agent.

6760334176. Ce^{3+} and La^{3+} salts are colored and paramagnetic.

Question Number : 40 Question Id : 6760331390 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

The oxidation states of Fe in $[Fe(NCS)(NH_3)_5]SO_4$, $Na_3[Fe(S_2O_3)_3]$ and $[Fe(CO)_5]$ respectively are

Options :

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6760334177. 3, 2 and 1

6760334178. 3, 3 and 0

6760334179. 2, 3 and –2

6760334180. 3, 3 and –2

Question Number : 41 Question Id : 6760331391 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

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

Assertion A : Fluoride ion concentration above 2 ppm causes brown mottling of teeth.

Reason R : The presence of fluoride ions in drinking water converts hydroxyapatite (tooth enamel) into fluorapatite.

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

Options :

6760334181. Both A and R are correct and R is the correct explanation of A

6760334182. Both A and R are correct but R is **NOT** the correct explanation of A

6760334183. A is correct but R is **NOT** correct

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6760334184. A is **NOT** correct but R is correct.

Question Number : 42 Question Id : 6760331392 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

In the detection of nitrogen in an organic compound by Lassaigne's test, the iron compounds formed are

Options :

6760334185. $[Fe(CN)_6]^{3-}$, $Fe[Fe(CN)_6]\cdot xH_2O$

6760334186. $[Fe(CN)_6]^{4-}$, $Fe_2[Fe(CN)_6]\cdot xH_2O$

6760334187. $[Fe(CN)_6]^{4-}$, $Fe_4[Fe(CN)_6]_3\cdot xH_2O$

6760334188. $[Fe(CN)_6]^{3-}$, $Fe_3[Fe(CN)_6]_2\cdot xH_2O$

Question Number : 43 Question Id : 6760331393 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

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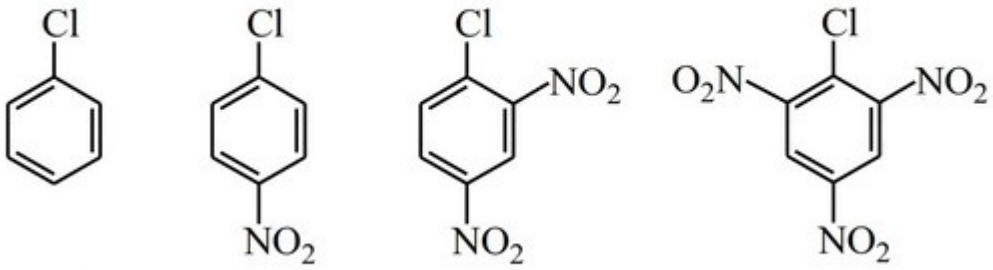
Order of reactivity for hydrolysis of substituted chlorobenzenes in the presence of aqueous NaOH is



(A) (B) (C) (D)

Options :

6760334189. C > B > D > A.

6760334190. A > B > C > D

6760334191. D > C > B > A

6760334192. B > C > D > A

Question Number : 44 Question Id : 6760331394 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

The correct structure of *cis*–2,4-dimethylhept-3-ene is,

Options :

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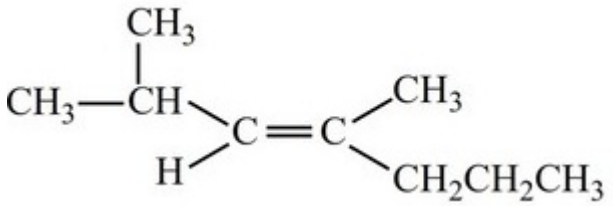
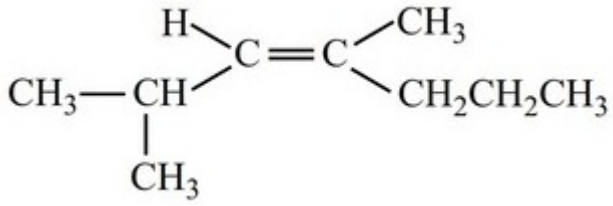
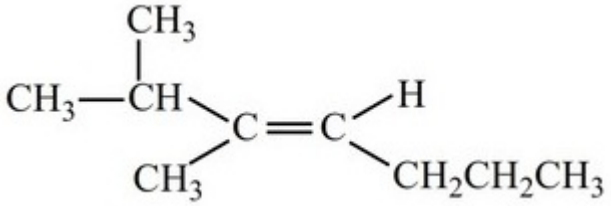
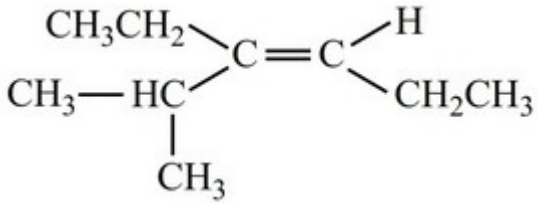
6760334193. 

6760334194. 

6760334195. 

6760334196. 

Question Number : 45 Question Id : 6760331395 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

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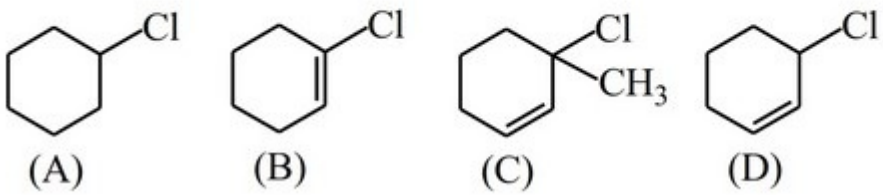
Arrange the following halides in the increasing order of their reactivity towards S_N1 reaction mechanism.



(A) (B) (C) (D)

Options :

6760334197. A < B < D < C

6760334198. B < A < D < C

6760334199. C < D < B < A

6760334200. C < D < A < B

Question Number : 46 Question Id : 6760331396 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

Which one of the following reagents are not suitable for the preparation of benzaldehyde from benzene?

Options :

6760334201.
a) CH_3Cl + Anhyd. $AlCl_3$
b) $CrO_2Cl_2 + CS_2 / H_3O^+$

6760334202.
a) CH_3Cl + Anhyd. $AlCl_3$
b) Cl_2/Fe dark / H_2O (373K)

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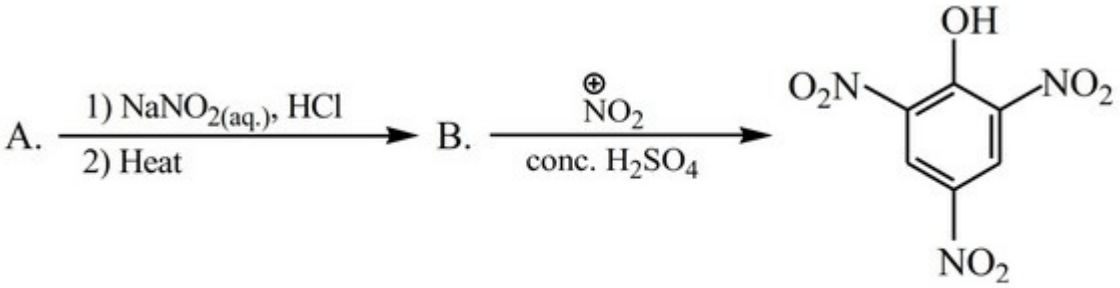
6760334203.

a) CO, HCl, Anhyd. $AlCl_3$

a) CH_3Cl + Anhyd. $AlCl_3$

6760334204. b) CrO_3, $(CH_3CO)_2O$, H_3O^+ (Heat)

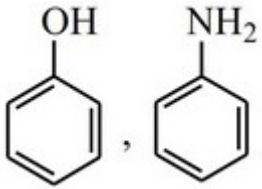
Question Number : 47 Question Id : 6760331397 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1



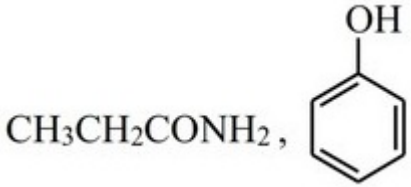
In the above reaction sequence the compounds A and B respectively are

Options :

6760334205.



6760334206.



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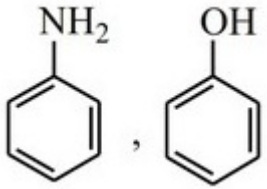
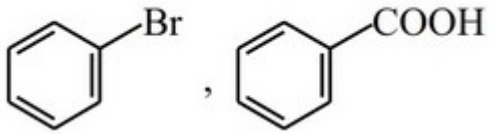
6760334207. 

6760334208. 

Question Number : 48 Question Id : 6760331398 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

Match List I with II

List I	List II (Ion detected)
A. Borax Bead test	I. As^{3+}
B. Charcoal cavity test	II. Al^{3+}
C. Flame test	III. Fe^{3+}
D. Lake test	IV. Sr^{2+}

Choose the correct answer from the options given below :

Options :

6760334209. A – III, B – I, C – IV, D – II

6760334210. A – IV, B – I, C – II, D – III

6760334211. A – III, B – II, C – IV, D – I

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6760334212. A – I, B – III, C – IV, D – II

Question Number : 49 Question Id : 6760331399 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

Select the odd group

Options :

6760334213. Protein, Starch, Cellulose

6760334214. Nylon 6, Polythene, Teflon

6760334215. Rayon, Caprolactum, Buna-S

6760334216. Nylon 6,6, Dacron, Buna-N

Question Number : 50 Question Id : 6760331400 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

Which one of the following represents the correct structure of a dinucleotide?

Options :

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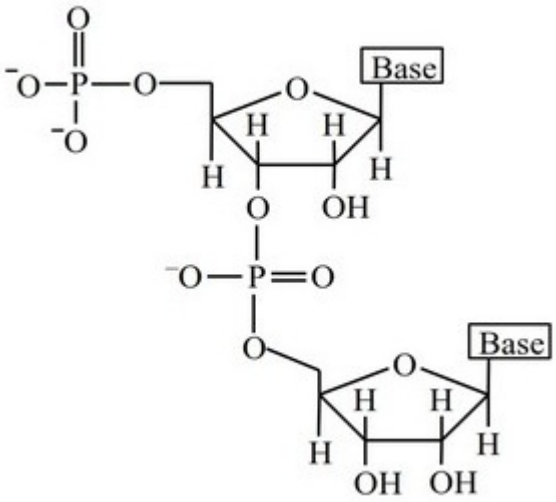
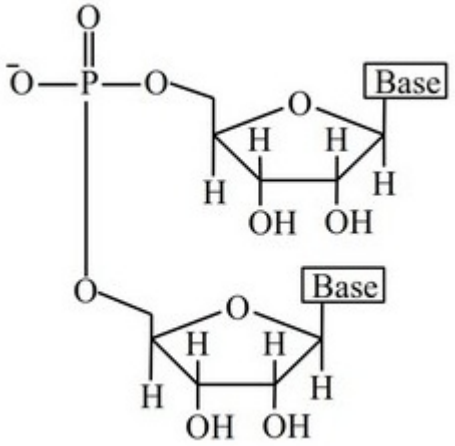
6760334217.



6760334218.



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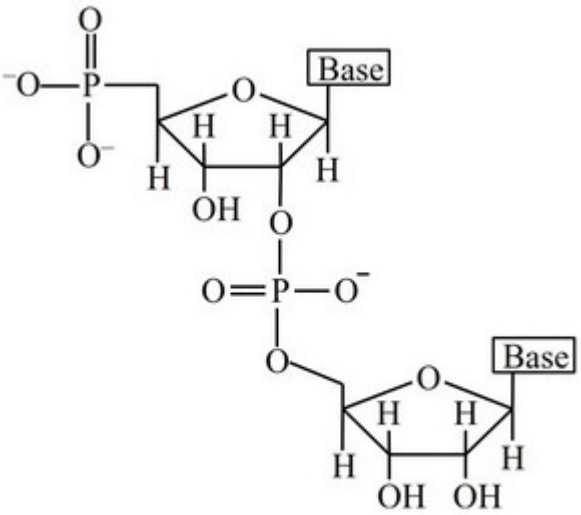
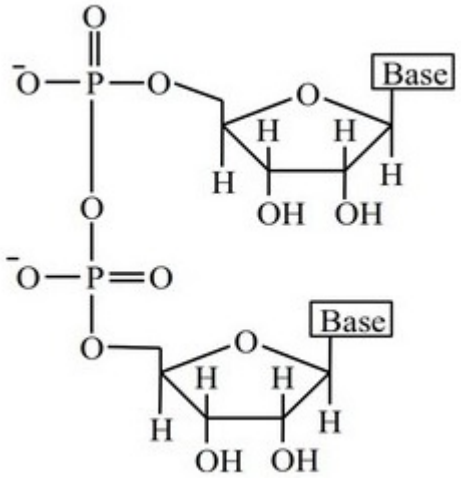


6760334219.



6760334220.

Chemistry Section B

Section Id :	67603394
Section Number :	4
Section type :	Online
Mandatory or Optional :	Mandatory

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Number of Questions :	10
Number of Questions to be attempted :	5
Section Marks :	20
Enable Mark as Answered Mark for Review and Clear Response :	Yes
Sub-Section Number :	1
Sub-Section Id :	67603394
Question Shuffling Allowed :	Yes

Question Number : 51 Question Id : 6760331401 Question Type : SA
Correct Marks : 4 Wrong Marks : 0

Chlorine is prepared according to the following equation :

$$4HCl + MnO_{2(s)} \longrightarrow 2H_2O_{(l)} + MnCl_{2(aq)} + Cl_{2(g)}.$$

10g sample of MnO_2 produces 2.24L of chlorine under SATP, the percentage purity of the MnO_2 sample is _____. (Nearest integer)

[Atomic weight = H : 1.0, O : 16.0, C : 12.0, Cl : 35.5, Mn : 55.0]

[SATP : T = 298K, P = 10^5 Pa]

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Equal
Text Areas : PlainText
Possible Answers :
100

Question Number : 52 Question Id : 6760331402 Question Type : SA
Correct Marks : 4 Wrong Marks : 0

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The total kinetic energy of 10 moles of a monoatomic ideal gas at 25°C in kJ is _____. (Nearest integer)

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

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Equal
Text Areas : PlainText
Possible Answers :
100

Question Number : 53 Question Id : 6760331403 Question Type : SA
Correct Marks : 4 Wrong Marks : 0
The ratio of radii for the first and third orbits of hydrogen atom is 1 : x. The value of x is _____. (Integer answer)

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Equal
Text Areas : PlainText
Possible Answers :
100

Question Number : 54 Question Id : 6760331404 Question Type : SA
Correct Marks : 4 Wrong Marks : 0

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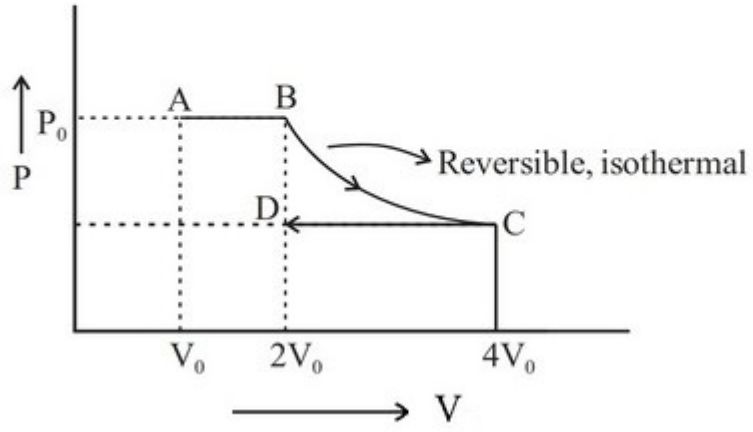
The work done by an ideal monoatomic gas when it is taken along the path ABCD as shown in the figure is xP_0V_0. The value of $(-x)$ is _____. (Nearest integer)

[ln 2 = 0.69]



Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Equal
Text Areas : PlainText
Possible Answers :
100

Question Number : 55 Question Id : 6760331405 Question Type : SA
Correct Marks : 4 Wrong Marks : 0
The pH of the solution resulted when 150 mL of 0.1 M ammonia solution is titrated with 50 mL of 0.1M HCl [$pK_b(NH_3) = 4.7$] is _____. (Nearest integer)

[$\log_{10} 2 = 0.30$]

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes

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Answers Type : Equal
Text Areas : PlainText
Possible Answers :
100

Question Number : 56 Question Id : 6760331406 Question Type : SA
Correct Marks : 4 Wrong Marks : 0
The potential of a cell containing two hydrogen electrodes, one in contact with 10^{-8} M H^+ concentration and the other in contact with 0.025 M H^+ concentration is $x \times 10^{-4}$ V. The value of x is _____. (Nearest integer)

[Given : $\frac{2.303\,RT}{F} = 0.059$ and $\log_{10} 2 = 0.30$]

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Equal
Text Areas : PlainText
Possible Answers :
100

Question Number : 57 Question Id : 6760331407 Question Type : SA
Correct Marks : 4 Wrong Marks : 0
The inactivation process of virus is first order with respect to virus concentration and 2% of the virus was inactivated in the first one minute. Time taken (in minutes) for the virus to become 75% inactivated is _____. (Nearest integer)

[Use $\log_{10} 2 = 0.3010$, $\log_{10} 3 = 0.4771$]

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Equal

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Text Areas : PlainText
Possible Answers :
100

Question Number : 58 Question Id : 6760331408 Question Type : SA
Correct Marks : 4 Wrong Marks : 0

In an adsorption isotherm, it is seen that the graph of $\log\left(\frac{x}{m}\right)$ *vs* log P, where P is in atm, is a straight line inclined at 45° and the intercept is 0.699. The amount of solute in grams adsorbed per gram of adsorbent at a pressure of 0.5 atm is $x \times 10^{-3}$. The value of x is _____. (Nearest integer)

[Use $\log_{10} 2 = 0.3010$; $\tan 45^\circ = 1$]

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Equal
Text Areas : PlainText
Possible Answers :
100

Question Number : 59 Question Id : 6760331409 Question Type : SA
Correct Marks : 4 Wrong Marks : 0

The number of electrophiles in the list below is _____. (Integer answer)

$\overset{\oplus}{N}O_2, CH_3-\overset{\oplus}{C}=O, H_2O, \overset{\oplus}{N}O$

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Equal

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Text Areas : PlainText
Possible Answers :
100

Question Number : 60 Question Id : 6760331410 Question Type : SA
Correct Marks : 4 Wrong Marks : 0
The number of isomers with molecular formula C_3H_9N, which will react with $CHCl_3 + KOH$ is _____. (Integer answer)
Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Equal
Text Areas : PlainText
Possible Answers :
100

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