

CHEMISTRY

BOOKS - AIIMS PREVIOUS YEAR PAPERS

AIIMS 2005

Chemistry

1. Among the following molecules, (i) XeO_3 (ii) $XeOF_4$ (iii) XeF_6 those having same number of lone pairs on Xe are:

A. (i) and (ii) only

B. (i) and (ii) only

C. (ii) and (iii) only

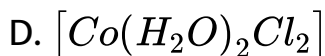
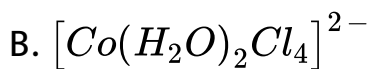
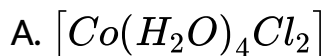
D. (i), (ii) and (iii)

Answer: D



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2. An aqueous solution of $COCL_2$ on addition of excess of concentrated HCl turns blue due to formation of

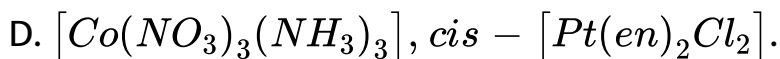
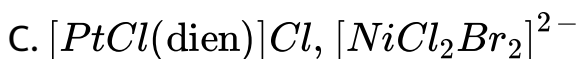
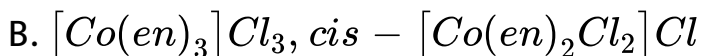
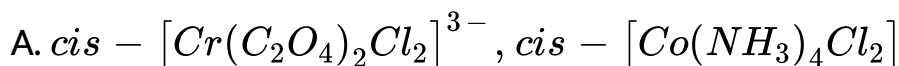


Answer: C



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3. In which of the following pairs both the complex show optical isomerism? .

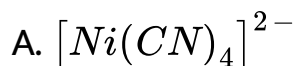


Answer: B



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4. The diamagnetic species is

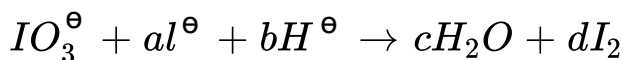


Answer: A



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5. In the balanced chemical reaction



a , b , c , and d , respectively, correspond to

A. 5,6,3,3

B. 5,3,6,3

C. 3,5,3,6

D. 5,6,5,5

Answer: A

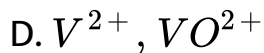
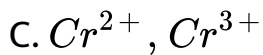


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6. Among the following pairs of ions the lower oxidation state in aqueous solution is more stable than the other in

A. Tl^+ , Tl^{3+}

B. Cu^+ , Cu^{2+}



Answer: A



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7. The number of $P - O - P$ bridge in the structure of phosphorous pentoxide and phosphorus trioxide are respectively

A. 6,6

B. 5,5

C. 5,6

D. 6,5

Answer: A



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8. In diborane, the two $H - B - H$ angles are nearly

A. 60° , 120°

B. 95° , 120°

C. 95° , 150°

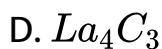
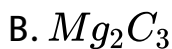
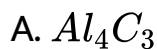
D. 120° , 180°

Answer: B



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9. Which of the following gives propyne on hydrolysis ?

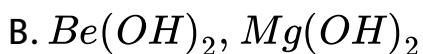
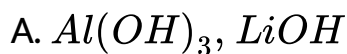


Answer: B



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10. The pair of amphoteric hydroxides is



C. $B(OH)_3$, $Be(OH)_2$

D. $Be(OH)_2$, $Zn(OH)_2$

Answer: D



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11. Which of the following is a carbonate ore?

A. pyrolusite

B. malachite

C. diaspore

D. cassiterite.

Answer: B

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12. ${}_{92}\text{U}^{238}$ emits 8α – particles and 6β – particles. The n/p ratio in the product nucleus is a) $\frac{62}{41}$ b) $\frac{60}{41}$ c) $\frac{61}{42}$ d) $\frac{62}{42}$

A. $60/41$

B. $61/40$

C. $62/41$

D. $61/42$

Answer: C

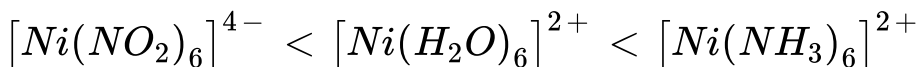
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13. The correct order for the wavelength of absorption in the visible region is

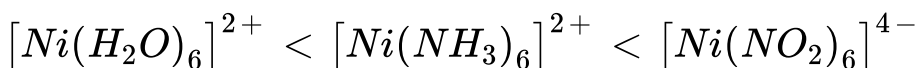
A.



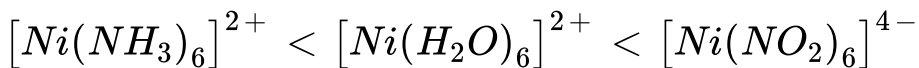
B.



C.



D.

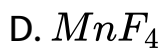
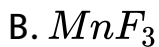


Answer: A



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14. F_2 is formed by reacting K_2MnF_6 with

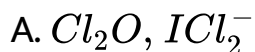


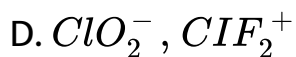
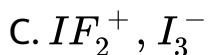
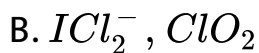
Answer: A



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15. The isoelectronic pair is





Answer: D



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16. Which of the following chemicals are used to manufacture methyl isocyanate that caused Bhopal Tragedy ?

Methylamine

(ii) Phosgene

(iii) Phosphine (iv) Dimethylamine .

- A. (i) and (iii)
- B. (iii) and (iv)
- C. (i) and (ii)
- D. (ii) and (iv)

Answer: C



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17. α -Particles can be detected using

- A. thin aluminium sheet
- B. barium sulphate
- C. zinc sulphide screen

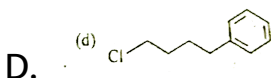
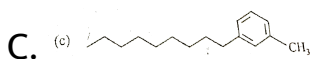
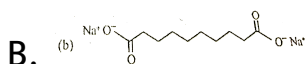
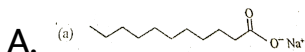
D. gold foil.

Answer: C



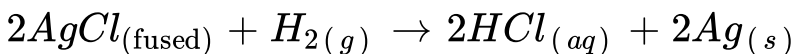
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18. Which of the following molecules is most suitable to disperse benzen in water?

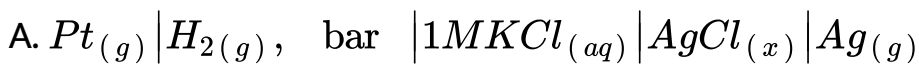


Answer: C

19. The chemical reaction



taking place in a galvanic cell is represented by the notation



B.



C.



D.



Answer: B



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20. If ' Z ' is the number of atoms in the unit cell that represents the closet packing sequence..... $ABCABC$

The number of tetrahedral voids in the unit cell is equal

A. Z

B. $2Z$

C. $Z/2$

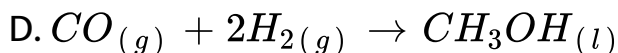
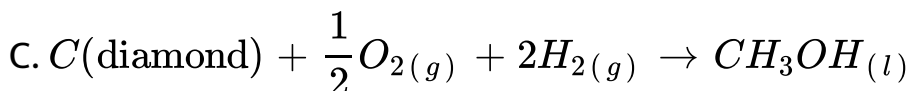
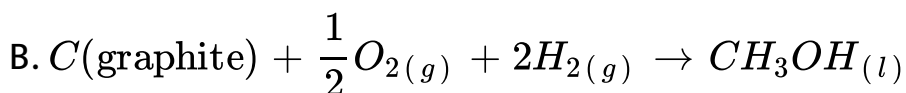
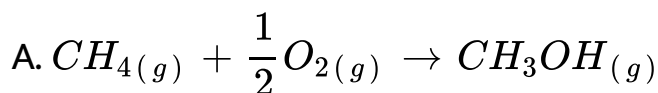
D. $Z/4$

Answer: B



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21. ΔH_f^\ominus , $298K$ of methanol is given by the chemical equation

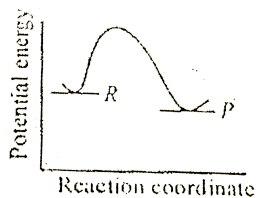


Answer: B

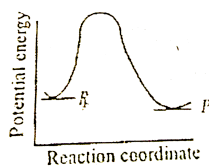


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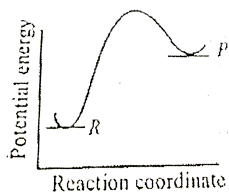
22. An endothermic reaction with high activation energy for the forward reaction is given by the diagram



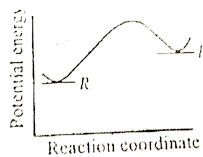
A.



B.



C.



D.

Answer: C



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23. When 10ml of $0.1M$ acetic acid ($pK_a = 5.0$) is titrated against 10ml of $0.1M$ ammonia solution ($pK_b = 5.0$), the equivalence point occurs at pH

A. 5.0

B. 6.0

C. 7.0

D. 9.0

Answer: C



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24. The most probable radius (in pm) for finding the electron in He^+ is.

A. 0.0

B. 52.9

C. 26.5

D. 105.8

Answer: C



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25. For the reaction of one mole of zinc dust with one mole of sulphuric acid in a bomb calorimeter ΔU and w

correspond to

A. $\Delta U < 0, w = 0$

B. $\Delta U < 0, w < 0$

C. $\Delta U > 0, w = 0$

D. $\Delta U > 0, w > 0$

Answer: A



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26. For reaction $aA \rightarrow xP$, when $[A] = 2.2mM$, the rate was found to be $2.4mMs^{-1}$. On reducing concentration of A to half, the rate changes to $0.6mMs^{-1}$. The order of reaction with respect to A is

A. 1.5

B. 2.0

C. 2.5

D. 3.0

Answer: B



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27. For the reaction: $2\text{NOCl}(g) \rightleftharpoons 2\text{NO}(g) + \text{Cl}_2(g)$, K_c at 427°C is $3 \times 10^{-6} \text{ L mol}^{-1}$. The value of K_p is

A. 7.50×10^{-5}

B. 2.50×10^{-5}

C. 2.50×10^{-4}

D. 1.75×10^{-4}

Answer: D

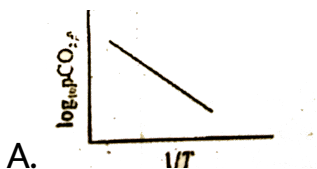


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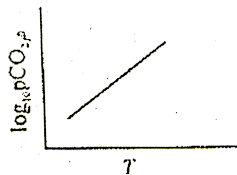
28. For the chemical equilibrium,



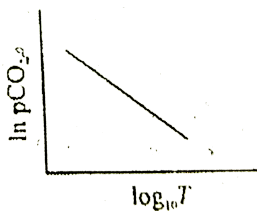
$\Delta_r H^\ominus$ can be determined from which one of the following plots?



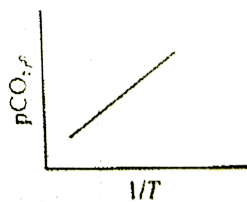
B.



C.



D.



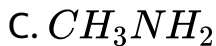
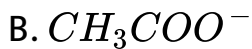
Answer: A



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29. Among the following, the strongest nucleophile is:

A. $\text{C}_2\text{H}_2\text{SH}$

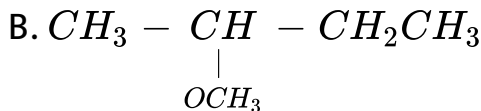
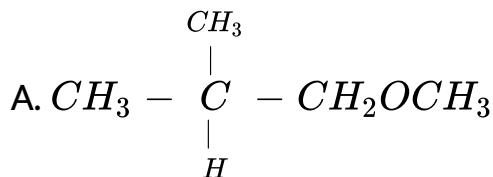
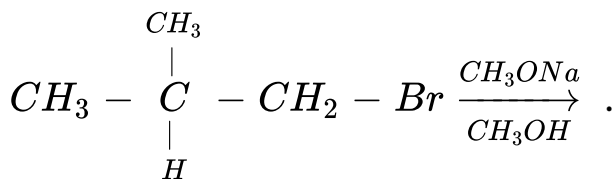


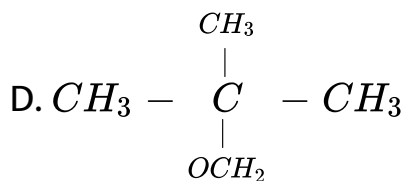
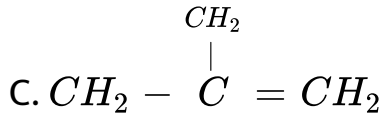
Answer: A



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30. The major product formed in the following reaction is

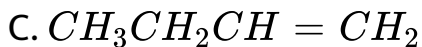
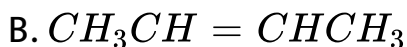




Answer: D

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31. The major product obtained on treatment of $CH_3CH_2CH(F)CH_3$ with CH_3O^- / CH_3OH is :



Answer: B



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32. Among the following the most stable compound is

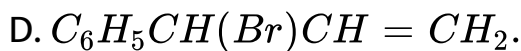
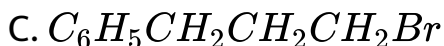
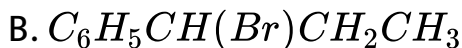
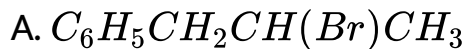
- A. cis-1,2-cyclohexanediol
- B. trans-1,2-cyclohexanediol
- C. cis-1,3-cyclohexenediol
- D. trans-1,3-cyclohexanediol.

Answer: D



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33. 3-Phenylpropene on reaction with HBr gives (as major product)

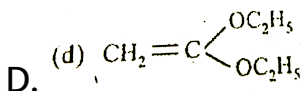
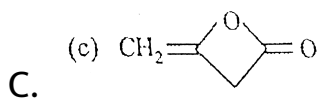


Answer: B



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34. $CH_3CO_2C_2H_5$ on reaction with sodium ethoxide in ethanol gives A , which on heating in the presence of acid gives B compound B is



Answer: C



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35. Among the following which one does not act as an intermediate in hofmann rearrangement





Answer: D



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36. Pyridine is less basic than triethylamine because :

A. pyridine has aromatic character

B. nitrogen in pyridine is sp^2 hybridised

C. pyridine is a cyclic system

D. in pyridine, lone pair of nitrogen is delocalised.

Answer: D



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37. Which one of the following biomolecules is insoluble in water

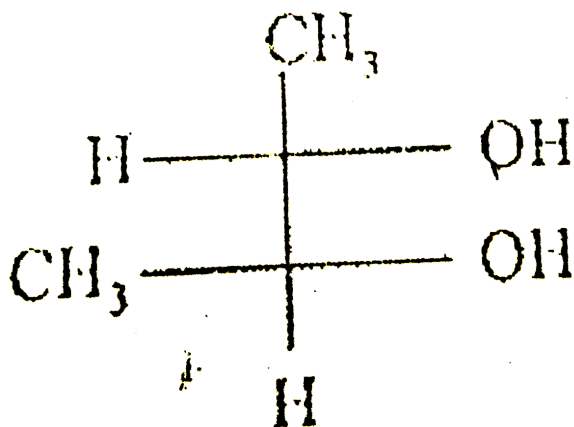
- A. α -keratin
- B. haemoglobin
- C. ribonuclease
- D. adenine.

Answer: A



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38. Correct configuration of the following is



A. 1S, 2S

B. 1S, 2R

C. 1R, 2S

D. 1R, 2R

Answer: A



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39. Which one of the following statements is true for protein synthesis (translation) ?

- A. amino acids are directly recognized by m-Rna
- B. the third base of the codon is less specific
- C. only one codon codes for an amino acid
- D. every t-RNA molecule has more than one amino acid attachment.

Answer: B



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40. $C_6H_5CONHCH_3$ can be converted into $C_6H_5CH_2NHCH_3$ by .

- A. If both assertion and reason are true and reason is the correct explanation of assertion
- B. If both assertion and reason are true but reason is not the correct explanation of assertion
- C. If assertion is true but reason is false
- D. If both assertion and reason are false

Answer: D



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41. Assertion: Reaction of SO_2 and H_2S in the presence of Fe_2O_3 catalyst gives elemental sulphur.

Reason: SO_2 is a reducing agent.

- A. If both assertion and reason are true and reason is the correct explanation of assertion
- B. If both assertion and reason are true but reason is not the correct explanation of assertion
- C. If assertion is true but reason is false
- D. If both assertion and reason are false

Answer: B



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42. Assertion: SiF_6^{2-} is known but $SiCl_6^{2-}$ is not.

Reason: Size of fluorine is small and its lone pair of electrons intersects with d-orbitals of Si strongly.

A. If both assertion and reason are true and reason is the correct explanation of assertion

B. If both assertion and reason are true but reason is not the correct explanation of assertion

C. If assertion is true but reason is false

D. If both assertion and reason are false

Answer: A



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43. Borax bead test is not suitable of for $Al(III)$

Al_2O_3 is insoluble in H_2O .

A. If both assertion and reason are true and reason is the correct explanation of assertion

B. If both assertion and reason are true but reason is not the correct explanation of assertion

C. If assertion is true but reason is false

D. If both assertion and reason are false

Answer: B



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44. Statement -1 : Ozone is a powerful oxidising agent in comparison to O_2 .

Statement -1 : O_3 molecules is diamagnetic but O_3^- is paramagnetic.

- A. If both assertion and reason are true and reason is the correct explanation of assertion
- B. If both assertion and reason are true but reason is not the correct explanation of assertion
- C. If assertion is true but reason is false
- D. If both assertion and reason are false

Answer: B



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45. Assertion : Potassium ferrocyanide is diamagnetic whereas potassium ferricyanide is paramagnetic.

Reason : Crystal field splitting in ferrocyanide ion is greater than that of ferricyanide ion.

A. If both assertion and reason are true and reason is the correct explanation of assertion

B. If both assertion and reason are true but reason is not the correct explanation of assertion

C. If assertion is true but reason is false

D. If both assertion and reason are false

Answer: C





46. Assertion (A): Addition of NH_4OH to an aqueous solution of $BaCl_2$ in the presence of excess of NH_4Cl precipitates $Ba(OH)_2$.

Reason (R): $Ba(OH)_2$ is insoluble in water.

- A. If both assertion and reason are true and reason is the correct explanation of assertion
- B. If both assertion and reason are true but reason is not the correct explanation of assertion
- C. If assertion is true but reason is false
- D. If both assertion and reason are false

Answer: D



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47. Assertion: $SeCl_4$, does not have a tetrahedral structure.

Reason: Se in $SeCl_4$ has two lone pairs.

- A. If both assertion and reason are true and reason is the correct explanation of assertion
- B. If both assertion and reason are true but reason is not the correct explanation of assertion
- C. If assertion is true but reason is false
- D. If both assertion and reason are false

Answer: C



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48. Each question contains STATEMENT-1(Assertion) and STATEMENT-2(Reason).the statement carefully and mark the correct answer accoring to the instrution given below:

STATEMENT - 1 : The molecular mass of acetic acid determined by depression in freezing point method in benzene and water was found to be differrent.

STATEMENT - 2 : Water is polar and benzene is non-polar.

A. If both assertion and reason are true and reason is the correct explanation of assertion

- B. If both assertion and reason are true but reason is not the correct explanation of assertion
- C. If assertion is true but reason is false
- D. If both assertion and reason are false

Answer: A



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49. Assertion: Compressibility factor for hydrogen varies with pressure with positive slope at all pressures.

Reason: Event at low pressures, repulsive forces dominate hydrogen gas.

- A. If both assertion and reason are true and reason is the correct explanation of assertion
- B. If both assertion and reason are true but reason is not the correct explanation of assertion
- C. If assertion is true but reason is false
- D. If both assertion and reason are false

Answer: A



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50. Assertion : First ionization energy is lower than oxygen.

Reason : Across a period effective charge decreases.

- A. If both assertion and reason are true and reason is the correct explanation of assertion
- B. If both assertion and reason are true but reason is not the correct explanation of assertion
- C. If assertion is true but reason is false
- D. If both assertion and reason are false

Answer: D



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51. Assertion B_2 molecule is diamagnetic

Reasoning The highest occupied molecular orbital is of sigma type .

- A. If both assertion and reason are true and reason is the correct explanation of assertion
- B. If both assertion and reason are true but reason is not the correct explanation of assertion
- C. If assertion is true but reason is false
- D. If both assertion and reason are false

Answer: D



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52. Assertion : Rate of hydrolysis of methyl chloride to methanol is higher in DMF than in water.

Reason : Hydrolysis of methyl chloride follows second order kinetics.

- A. If both assertion and reason are true and reason is the correct explanation of assertion
- B. If both assertion and reason are true but reason is not the correct explanation of assertion
- C. If assertion is true but reason is false
- D. If both assertion and reason are false

Answer: A



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53. Assertion (A): Galvanized iron does not rust.

Reason (R): Zn has a more negative electrode potential than Fe .

A. If both assertion and reason are true and reason is the correct explanation of assertion

B. If both assertion and reason are true but reason is not the correct explanation of assertion

C. If assertion is true but reason is false

D. If both assertion and reason are false

Answer: A



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54. Statement-I : Extraction of iron metal from iron oxide ore is carried out by heating with coke.

Statement-II : The reaction

$Fe_2O_3(s) \xrightarrow{\Delta} Fe(s) + 3/2O_2(g)$ is a spontaneous process at standard condition.

- A. If both assertion and reason are true and reason is the correct explanation of assertion
- B. If both assertion and reason are true but reason is not the correct explanation of assertion
- C. If assertion is true but reason is false
- D. If both assertion and reason are false

Answer: D



55. (A) Rate of nitration of benzene and hexadeuterobenzene are different.

(R) C-H bond is stronger than C-D bond.

A. If both assertion and reason are true and reason is the correct explanation of assertion

B. If both assertion and reason are true but reason is not the correct explanation of assertion

C. If assertion is true but reason is false

D. If both assertion and reason are false

Answer: D





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56. Assertion. *t*-Butyl Methyl ether is not prepared by the reaction of *t* – butyl bromide with sodium methoxide.

Reason: Sodium methoxide is a strong nucleophile.

- A. If both assertion and reason are true and reason is the correct explanation of assertion
- B. If both assertion and reason are true but reason is not the correct explanation of assertion
- C. If assertion is true but reason is false
- D. If both assertion and reason are false

Answer: B



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57. Assertion: Maltose is a reducing sugar, one molecule of which gives two molecules of d-glucose on hydrolysis.

Reason: Maltose has a 1,4 β -glycosidic linkage.

- A. If both assertion and reason are true and reason is the correct explanation of assertion
- B. If both assertion and reason are true but reason is not the correct explanation of assertion
- C. If assertion is true but reason is false
- D. If both assertion and reason are false

Answer: C



58. (A) $p - O_2N - C_6H_4COCH_3$ is prepared by Friedel Crafts acylation of nitrobenzene.

(R) Nitrobenzene easily undergoes electrophilic substitution reaction.

A. If both assertion and reason are true and reason is the correct explanation of assertion

B. If both assertion and reason are true but reason is not the correct explanation of assertion

C. If assertion is true but reason is false

D. If both assertion and reason are false

Answer: D



59. Assertion : Alkyl isocyanides in acidified water give alkyl formamides.

Reason : In isocyanides, carbon first act as a nucleophile and then as electrophile.

- A. If both assertion and reason are true and reason is the correct explanation of assertion
- B. If both assertion and reason are true but reason is not the correct explanation of assertion
- C. If assertion is true but reason is false
- D. If both assertion and reason are false

Answer: A



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60. Assertion : Cyclopentadienyl anion is much more stable than allyl anion.

Reason : Cyclopentadienyl anion is aromatic in character.

- A. If both assertion and reason are true and reason is the correct explanation of assertion
- B. If both assertion and reason are true but reason is not the correct explanation of assertion
- C. If assertion is true but reason is false
- D. If both assertion and reason are false

Answer: A



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