



CHEMISTRY

BOOKS - AIIMS PREVIOUS YEAR PAPERS

AIIMS 2016

Chemistry

1. According to Bohr's theory, which of the following correctly represents the variation of energy and radius of an electron in n th orbit of H-atom?

A. $E_n \propto \frac{1}{n^2}, r \propto \frac{1}{n^2}$

B. $E_n \propto \frac{1}{n^2}, r \propto n^2$

C. $E_n \propto n^2, r \propto n^2$

D. $E_n \propto n, r \propto \frac{1}{n}$

Answer: B



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2. For which of the following elements it is difficult to disproportionate in +3 oxidation state?

A. N

B. As

C. Sb

D. Bi

Answer: D



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3. Best reagent for the conversion of $AgNO_3$ to

Ag is

A. $HClO_4$

B. H_3PO_2

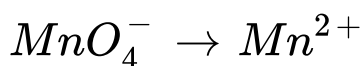


Answer: B



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4. How many Faradays of electricity are required for the given reaction to occur?



A. 5F

B. 3F

C. 1F

D. 7F

Answer: A



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5. K_p for the reaction $A \rightleftharpoons B$ is 4. If initially only A is present then what will be the partial pressure of B after equilibrium ?

A. 1.2

B. 0.8

C. 0.6

D. 1

Answer: B



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6. Paints and hair creams are respectively

A. sol and emulsion

B. aerosol and foam

C. emulsion and sol

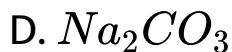
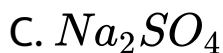
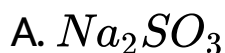
D. foam and gel.

Answer: A



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7. Chlorine oxidizes sodium thiosulphate to form



Answer: C



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8. Large difference in boiling points is observed in

A. N and P

B. P and As

C. As and Sb

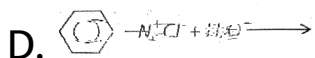
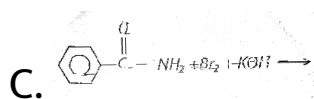
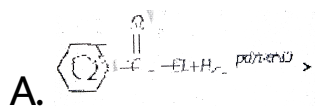
D. Sb and Bi

Answer: C



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9. Benzaldehyde can be prepared from

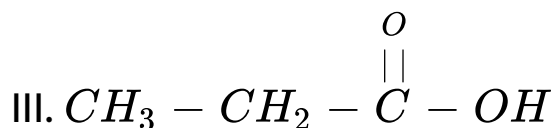
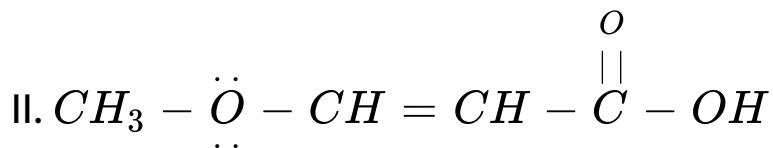
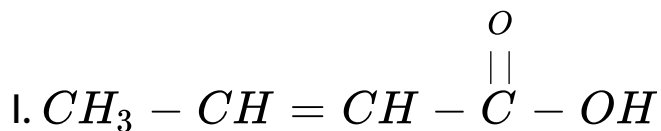


Answer: A



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10. The acidic strength of the given compounds follows the order



A. $II > III > I$

B. $III > II > I$

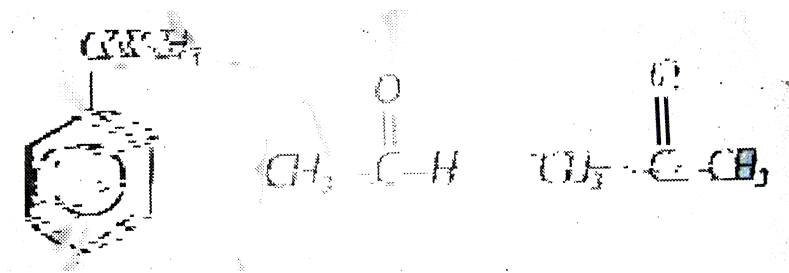
C. $II > I > III$

D. $I > II > III$

Answer: D

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11. Ease of nucleophilic addition in the given compounds is



A. $I > III > II$

B. $II > III > I$

C. $II > I > III$

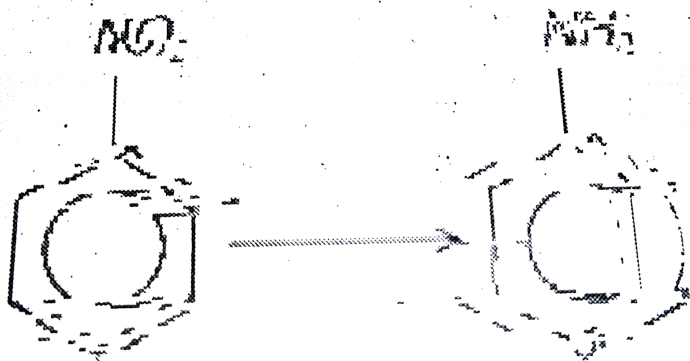
D. $III > I > II$

Answer: B



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12. Which of the following reagents cannot be used for the given conversion?



A. Sn-HCl

B. Fe-HCl

C. $LiAlH_4$

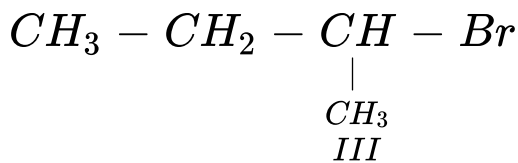
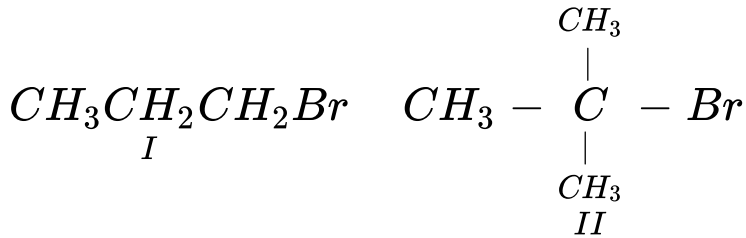
D. Pd/C

Answer: C



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13. Arrange the given compounds in decreasing order of boiling points.



A. $I > III > II$

B. $II > I > III$

C. $I > II > III$

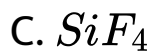
D. $III > I > II$

Answer: A



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14. Which of the following molecules has more than one lone pair ?



Answer: B



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15. If an atom crystallizes in bcc lattice with $r = 4\text{\AA}$ then the edge length will be

A. 2\AA

B. 8\AA

C. 2.39\AA

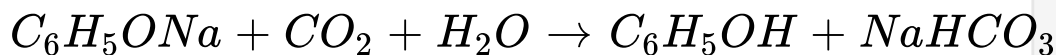
D. 9.23\AA

Answer: D



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16. The reaction,



suggests that :

- A. phenol is a stronger acid than carbonic acid
- B. carbonic acid is a stronger acid than phenol
- C. water is stronger acid than phenol
- D. None of these

Answer: B



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17. A first-order reaction which is 30 % complete in 30 minutes has a half-life period of

A. 102.2 min

B. 58.2 min

C. 24.2 min

D. 120.2 min

Answer: B



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18. Which of the following is not an aromatic species ?

A. Benzene

B. Cyclooctatetraenyl dianion

C. Tropylium ion

D. Cyclopentadienyl cation

Answer: D



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19. 10 mL of liquid carbon disulphide (specific gravity 2.63) is burnt in oxygen. Find the volume of the resulting gases measured at STP.

A. 23.25 L

B. 22.26 L

C. 23.50 L

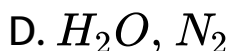
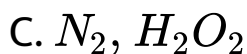
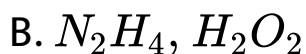
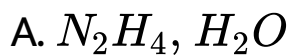
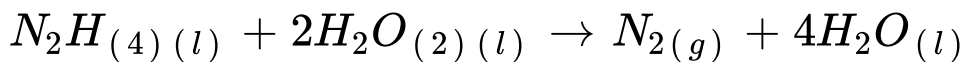
D. 20.08 L

Answer: A



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20. Substances that are oxidized and reduced in the following reaction are respectively.



Answer: B



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21. The heat liberated when 1.89g of benzoic acid is burnt in a bomb calorimeter at 25°C increases the temperature of 18.94kg of water by 0.632°C . If the specific heat of water at 25°C is 0.998cal/gdeg , the value of the heat of combustion of benzoic acid is

A. 881.1 kcal

B. 771.12 kcal

C. 981.1 kcal

D. 871.2 kcal

Answer: B



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22. Two elements A and B form compounds having molecular formula AB_2 and AB_4 . When dissolved in $20g$ of benzene, $1g$ of AB_2 lowers the freezing point by $2.3K$, whereas $1.0g$ of AB_4 lowers it by $1.3K$. The molar depression constant for benzene is $5.1Kkgmol^{-1}$. Calculate the atomic mass of A and B .

A. 25, 42

B. 42, 25

C. 52, 48

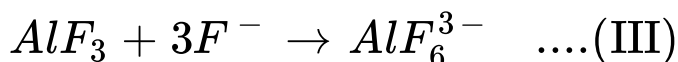
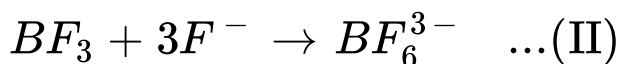
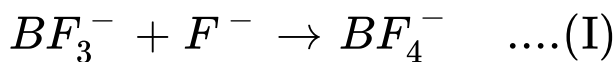
D. 48, 52

Answer: A



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23. Which of the following reactions does not take place?



A. Only (I)

B. Only (II)

C. Only (III)

D. Only (I) and (III)

Answer: B



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24. The freezing point of solution containing $0.2g$ of acetic acid in $20.0g$ of benzene is lowered by $0.45^{\circ}C$. Calculate the degree of association of acetic acid in benzene.

$$(K_f = 5.12K^{\circ}mol^{-1}kg^{-1})$$

A. 94.5 %

B. 54.9 %

C. 78.2 %

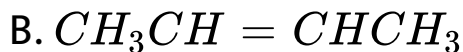
D. 100 %

Answer: A



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25. Which of the following alkenes will give same product by any method out of hydration, hydroboration-oxidation and oxymercuration-demercuration?



D.

Answer: B



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26. An element X belongs to fourth period and fifteenth group of the periodic table. Which one of

the following is true regarding the outer-electronic configuration of X ? It has

A. partially filled d orbitals and completely filled s orbital

B. completely filled s orbital and completely filled p orbitals

C. completely filled s orbital and half-filled p orbitals

D. half-filled d orbitals and completely filled s orbital.

Answer: C



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27. Which is not classified as thermoplastics?

A. Polyethylene

B. Polystyrene

C. Bakelite

D. Neoprene

Answer: C



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28. Select the correct statement.

A. Geometrical isomer may differ in dipole moment and visible/UV spectra.

B. Complexes of the type $[Ma_3b_3]$ can also have facial (fac) and meridional (mer) isomer.

C. No optical isomer exists for the complex $\text{trans-}[Co(en)_2Cl_2]^+$.

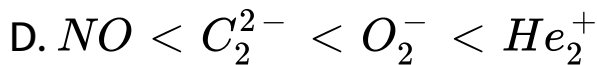
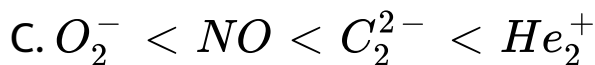
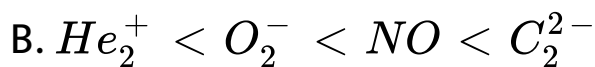
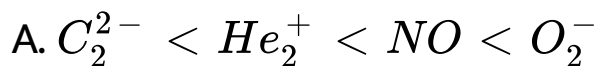
D. All of these.

Answer: D



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29. Four diatomic species are listed below in different sequences. Which of these represents the correct order of their increasing bond order?



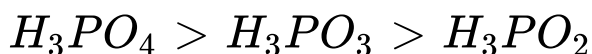
Answer: B



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30. The true statement for the acids of phosphorus, H_3PO_2 , H_3PO_3 and H_3PO_4 is

A. the order of their acidity is



B. all of them are reducing in nature

C. all of them are tribasic acids

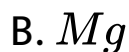
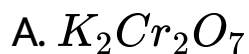
D. the geometry of phosphorus is tetrahedral in all the three.

Answer: D



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31. Which of the following can be oxidized by SO_2 ?



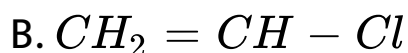
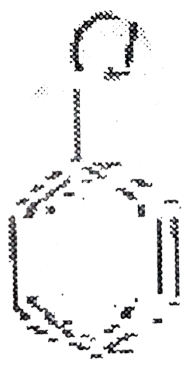
D. All of these.

Answer: B



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32. Which one of the following does not give white precipitate with acidified silver nitrate solution?



D. Both (a) and (b)

Answer: D



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33. Oil used as frothing agent in froth-floatation process is

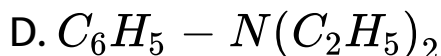
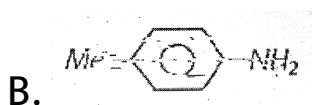
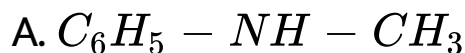
- A. pine oil
- B. mustard oil
- C. coconut oil
- D. olive oil.

Answer: A



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34. Which of the following amines gives positively the carbylamine test?



Answer: B



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35. During the decomposition of H_2O_2 to give oxygen, $48gO_2$ is formed per minute at a certain point of time. The rate of formation of water at this point is

A. $0.75mol\ min^{-1}$

B. $1.5mol\ min^{-1}$

C. $2.25mol\ min^{-1}$

D. $3.0mol\ min^{-1}$

Answer: D



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36. A conductivity cell has a cell constant of 0.5cm^{-1} . This cell when filled with 0.01 M NaCl solution has a resistance of 384 ohms at 25°C . Calculate the equivalent conductance of the given solution.

A. $130.2\Omega^{-1}\text{cm}^2(\text{geq})^{-1}$

B. $137.4\Omega^{-1}\text{cm}^2(\text{geq})^{-1}$

C. $154.6\Omega^{-1}\text{cm}^2(\text{geq})^{-1}$

D. $169.2\Omega^{-1}\text{cm}^2(\text{geq})^{-1}$

Answer: A



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37. Arsenic drugs are mainly used in the treatment of :

- A. Jaundice
- B. Typhoid
- C. Syphilis
- D. Cholera.

Answer: C



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38. Glucose $\xrightarrow{\text{HCN}}$ $\xrightarrow{\text{Hydrolysis}}$ $\xrightarrow{\text{HI, heat}}$ A, A is

A. heptanoic acid

B. 2-iodohexane

C. heptane

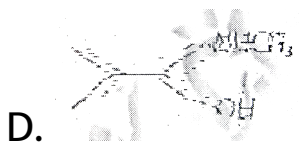
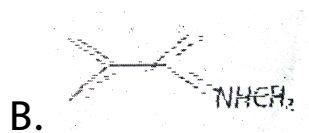
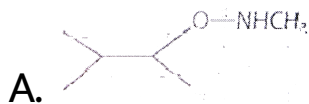
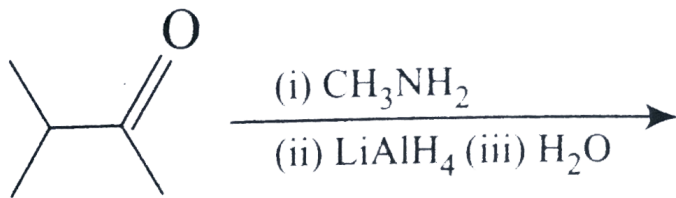
D. heptanol

Answer: A



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39. The major organic product formed in the following reaction is



Answer: B



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40. Among the following the achiral amino acid is:

- A. 2-ethylalanine
- B. 2-methylglycine
- C. 2-hydroxymethylserine
- D. tryptophan.

Answer: C



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41. Assertion : H_3BO_3 is a weak acid.

Reason : Water extracts the proton of H_3BO_3 .

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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42. Assertion : When acetamide reacts with $NaOH$ and Br_2 , methyl amine is formed.

Reason : The reaction occurs through intermediate formation of isocyanate.

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. Assertion : Chlorobenzene is more reactive than benzene towards the electrophilic substitution reaction.

Reason : Resonance destabilizes the carbocation.

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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44. Assertion :

$Co[Hg(SCN)_6]$ and $Hg[Co(SCN)_6]$ are isomers.

Reason : SCN^- is a stronger ligand as compared to NCS^-

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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45. Assertion : Acetone and aniline shows negative deviations.

Reason : H-bonding between acetone and aniline is stronger than that between acetone-acetone and aniline-aniline.

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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46. Assertion : Generally alkali and alkaline earth metals form superoxides.

Reason : There is single bond between O and O in superoxides.

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 : For hydrogen like species, energy of an electron in a particular orbit increases with increase in value of Z .

Reason : Electronegativity decreases across a period.

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. Assertion : Charcoal is used in separation of noble gases.

Reason : Charcoal has porous structure.

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 : bond angle is less than the normal tetrahedral bond angle.

Reason : Lone pair-lone pair repulsion decreases bond angle.

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 : Critical temperature of CO_2 is $304K$, it cannot be liquefied above $304K$.

Reason : At a certain temperature, volume $\propto 1/\text{pressure}$.

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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51. Assertion : Phenol is more acidic than ethanol.

Reason : Phenoxide ion is resonance stabilized.

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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52. Assertion : Diamagnetic substances are not attracted by magnetic field.

Reason : Diamagnetic substances have no unpaired electrons.

- 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 : Staggered conformation of ethane is 12.5 kJ mol^{-1} more stable than the eclipsed conformation.

Reason : The two conformations of ethane cannot be separated at room temperature.

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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54. Assertion (A): A reaction which is spontaneous and accompanied by decreases of randomness

must be exothermic.

Reason (R) : All exothermic reactions are accompanied by decrease of randomness.

- 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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55. Assertion : H_2S is stronger acid than PH_3 .

Reason : S is more electronegative than P, conjugate base HS^- is more stable than H_2P^- .

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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56. Assertion : 2-Methyl-1, 3-butadiene is the monomer of natural rubber.

Reason : Natural rubber is formed through anionic addition polymerization.

- 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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57. Assertion (A) The Duma's method is of more general application to nitrogen containing organic compounds than the Kjeldahl's method.

Reason (R) The Kjeldahl's method does not give satisfactory results for compounds in which nitrogen is directly linked to oxygen.

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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58. Assertion: A solution of sucrose in water is dextrorotatory. But on hydrolysis in the presence

of a little hydrochloric acid, it becomes laevaorotatory.

Reason : Sucrose on hydrolysis gives unequal amounts of glucose and fructose. As a result of this, change in sign of rotation is observed.

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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59. Assertion : In electrolysis, the quantity of electricity needed for depositing 1 mole silver is different from that required for 1 mole of copper.

Reason : The molecular weights of silver and copper are different.

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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60. Assertion : Heat of neutralization for both H_2SO_4 and HCl with $NaOH$ is $53.7kJmol^{-1}$.

Reason : Both HCl and H_2SO_4 are strong acids.

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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