



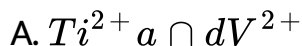
## CHEMISTRY

### BOOKS - AIIMS PREVIOUS YEAR PAPERS

#### AIIMS 2011

#### Chemistry

1. Which of the following pair of transition metal ions, have the same calculated values of magnetic moment?



D.  $Co^{2+}$  and  $Ti^{2+}$

**Answer: C**



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2. A radioactive substance  $(88)X^{228}$  (IIA) emits  $3\alpha$  and  $3\beta$ -particles to form 'Y'. O which group of long form of the periodic table does 'Y' belong?

A. IVA

B. VA

C. VIA

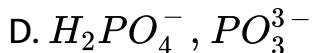
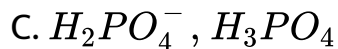
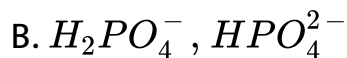
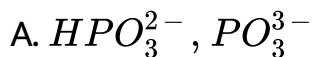
D. VIIA

**Answer: D**



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3. Which of the following is not a conjugate acid-base pair?

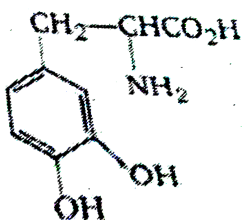
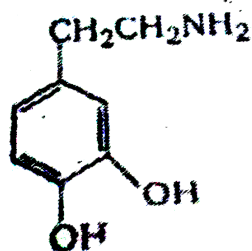
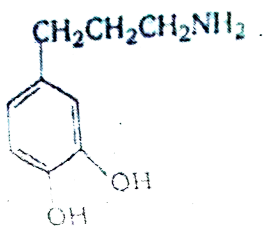
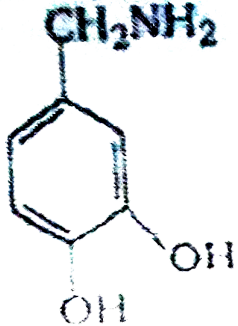


**Answer: D**



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4. Parkinson's disease is linked to abnormalities in the levels of dopamine in the. The structure of dopamine is :



Answer: C

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5. The wavelength of a spectral line emitted by hydrogen atom in the Lyman series is  $\frac{16}{15}R$  cm. What is the value of  $n_2$

A. 2

B. 3

C. 4

D. 1

**Answer: C**



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6. 138 g of ethyl alcohol is mixed with 72 g of water. The ratio of mole fraction of alcohol to water is

A. 3:4

B. 1:2

C. 1:4

D. 1:1

**Answer: A**



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7. Which of the following is a biodegradable polymer?

A. Polythene

B. Bakelite

C. PHBV

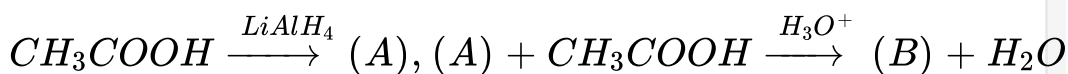
D. PVC

Answer: C

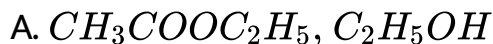


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8.



. In the above reaction 'A' and 'B' respectively are :



Answer: D



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9. Which of the following noble gases is used in miner's cap lamp ?

A. Helium

B. Neon

C. Argon

D. Krypton

**Answer: D**



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10. The following are some statements related to VA group hydrides



I) Reducing property increases from  $NH_3$  to  $BiH_3$

II) Tendency to donate lone pair decreases from  $NH_3$  to  $BiH_3$

III) Ease of replacing H with  $Cl$  decreases from  $NH_3$  to  $BiH_3$

IV) Ease of formation of hydrides decreases from  $NH_3$  to  $BiH_3$

The correct statement are

A. I,II,III and IV

B. I,III and IV

C. I,II and IV

D. I and IV

**Answer: A**



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11. Which of the following is not tetrahedral?

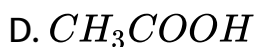
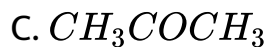
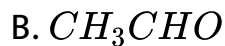
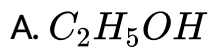


**Answer: C**



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12. An organic compound 'X' on treatment with pyridinium chlorochromate in dichloromethane gives compound 'Y'. Compound 'Y', reacts with  $I_2$  and alkali to form triiodomethane. The compound 'X' is :



**Answer: A**



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**13. Which of the following is not a peroxy acid?**

A. Perphosphoric acid

B. Pernitric acid

C. Perdisulphuric acid

D. Perchloric acid

**Answer: D**



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**14.** Which of the following is not correct?

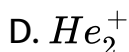
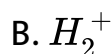
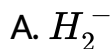
- A. Milk is a naturally occurring emulsion.
- B. Gold sol is a lyophilic sol.
- C. Physical adsorption decreases with rise in temperature.
- D. Chemical adsorption is unilayered.

**Answer: B**



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15. Which one of the following species is diamagnetic in nature ?



**Answer: C**



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16. Aluminium oxide may be electrolysed at  $1000^\circ\text{C}$  to furnish aluminium metal (Atomic mass = 27 amu, 1 Faraday = 96500 Coulomb). The cathode reaction is  $Al^{3+} + 3e^- \rightarrow Al$ . To

prepare 5.12 kg of aluminium metal by this method would require:

- A.  $5.49 \times 10^1 C$  of electricity
- B.  $5.49 \times 10^4 C$  of electricity
- C.  $1.83 \times 10^7 C$  of electricity
- D.  $5.49 \times 10^7 C$  of electricity

**Answer: D**



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17. The solubility product of a salt having general formula  $MX_2$  in water is  $4 \times 10^{-12}$ . The concentration of  $M^{2+}$  ions in the aqueous solution of the salt is:

A.  $4.0 \times 10^{-10} M$

B.  $1.6 \times 10^{-4} M$

C.  $1.0 \times 10^{-4} M$

D.  $2.0 \times 10^{-6} M$

**Answer: C**



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**18.** A reaction involving two different reactants can never be:

A. bimolecular reaction

B. second order reaction

C. first order reaction

D. unimolecular reaction

**Answer: D**



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**19.** During the process of electrolytic refining of copper some metals present as impurity settle as anode mud. These are

- A. Fe and Ni
- B. Ag and Au
- C. Pb and Zn
- D. Se and Ag

**Answer: B**



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20. Based on lattice energy and other considerations which one of the following alkali metal chlorides is expected to have the highest melting point

A. RbCl

B. RCl

C. NaCl

D. LiCl

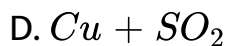
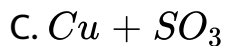
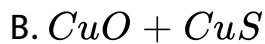
**Answer: C**



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21. Heating mixture of  $Cu_2O$  and  $Cu_2S$  will give

A.  $Cu_2SO_3$

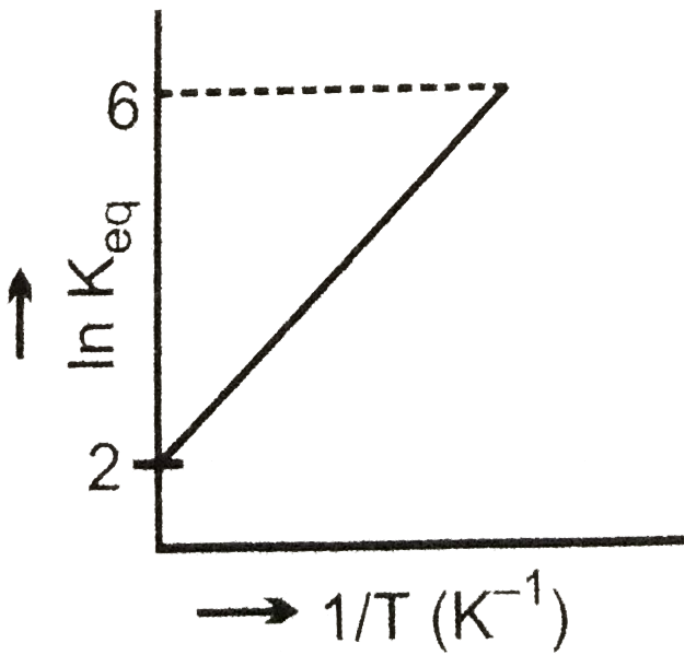


**Answer: D**



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**22.** A schematic plot of  $\ln K_{eq}$  versus inverse of temperature for a reaction is shown below



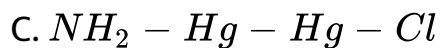
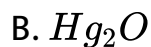
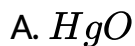
the reaction must be:

- A. highly spontaneous at ordinary temperature
- B. one with negligible enthalpy change
- C. endothermic
- D. exothermic

**Answer: D**

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23. Calomel ( $Hg_2Cl_2$ ) on reaction with ammonium hydroxide gives



Answer: D

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24. The IUPAC name of the coordination compound

$K_3[Fe(CN)_6]$  is:

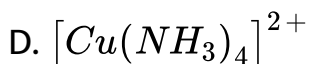
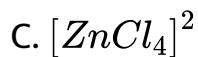
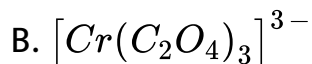
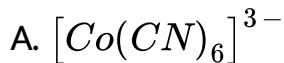
- A. tripotassium hexacyanoiron (II)
- B. potassium hexaxanoiron (II)
- C. potassium hexacyanoferrate (III)
- D. potassium hexacyanoferrate (II)

**Answer: C**



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25. Which of the following compounds shows optical isomerism?



**Answer: B**



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**26.** The best reagent to convert pent-3-en-2-ol into pent-3-en-2-one is

A. pyridinium chloro-chromate

B. chromic anhydride in glacial acetic acid

C. acidic dichromate

D. acidic permanganate

**Answer: B**



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27. A codon has a sequence of A and specifies a particular B that is to be incorporated into C what are ? A,B,C

- A. A-3 bases, B-amino acid, C-carbohydrate
- B. A-3 acids, B-carbohydrate, C-protein
- C. A-3 bases, B-protein, C-amino acid
- D. A-3 bases, B-amino acid, C-protein

**Answer: D**



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28. Which of the following statement in relation to the hydrogen atom is correct?

- A. 3s, 3p and 3d-orbitals all have the same energy
- B. 3s and 3p-orbitals are of lower energy than 3-orbitals  
are of lower energy than 3d-orbital
- C. 3p-orbital is lower in energy than 3d orbital
- D. 3s-orbital is lower in energy than 3p orbital

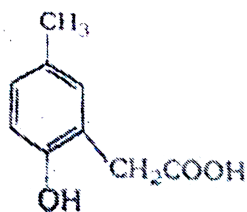
**Answer: A**



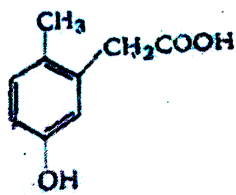
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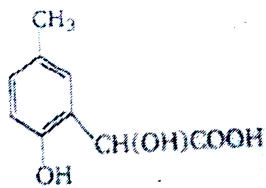
29. p-cresol reacts with chloroform in alkaline medium to give the compound A which adds hydrogen cyanide to form, the compound B. the latter on acidic hydrolysis gives chiral caboxylic acid. The structure of the carboxylic acid is



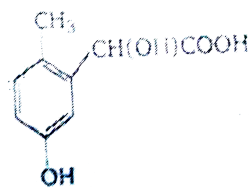
A.



B.



C.



D.

**Answer: C**



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**30.** If the bond dissociation energies of  $XY$ ,  $X_2$  and  $Y_2$  ( all diatomic molecules ) are in the ratio 1:1:0.5 and  $\Delta_f H$  of  $XY$  is  $-200 \text{ kJ mol}^{-1}$ . The bond dissociation energy of  $X_2$  will be :

A.  $400 \text{ kJ mol}^{-1}$

B.  $300 \text{ kJ mol}^{-1}$

C.  $200 \text{ kJ mol}^{-1}$

D.  $800 \text{ kJ mol}^{-1}$

**Answer: D**



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31.  $t_{1/4}$  can be taken as the time taken for concentration of reactant to drop to  $\frac{3}{4}$  of its initial value. If the rate constant for a first order reaction is  $K$ , then  $t_{1/4}$  can be written as:

A.  $0.75/k$

B.  $0.69/k$

C.  $0.29/k$

D.  $0.10/k$

**Answer: C**

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32. The number of sodium atoms in 2 moles of sodium ferrocyanide is

A.  $12 \times 10^{23}$

B.  $26 \times 10^{23}$

C.  $34 \times 10^{23}$

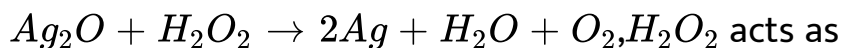
D.  $48 \times 10^{23}$

Answer: D



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33. In the reaction



A. reducing agent

- B. oxidising agent
- C. bleaching agent
- D. none of these

**Answer: A**



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**34.** Which of the following is used widely in the manufacture of lead storage battery?

- A. Arsenic
- B. Lithium
- C. Bismuth
- D. Antimony

**Answer: D**



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**35.** Two solutions of a substance (non-electrolyte) are mixed in the following manner , 480 mL of 1.5 M [first solution ] + 520 mL of 1.2 M [second solution ] . What is the molarity of the final mixture ?

A. 2.70 M

B. 1.344 M

C. 1.50 M

D. 1.20 M

**Answer: B**





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**36.** The oxidation state of chromium in the final product formed by the reaction between KI and acidified potassium dichromate solution is :

A. +3

B. +2

C. +6

D. +4

**Answer: A**



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37. The weight of iron which will be converted into its oxide ( $Fe_3O_4$ ) by the action of 18 g of steam on it will be: (Atomic mass of Fe=56)

A. 168 g

B. 84 g

C. 42 g

D. 21 g

**Answer: C**



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38. Calculate the work done during isothermal reversible expansion of one mole ideal gas from  $10\text{atm}$  to  $1\text{atm}$  at



300K.

A. 4938.8 J

B. 4138.8 J

C. 5744.1 J

D. 6257.2 J

**Answer: C**



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**39.** When alkyl halide is heated with dry  $Ag_2O$ . It produces :

A. ester

B. ether

C. ketone

D. alcohol

**Answer: B**



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**40.** How many atoms of calcium will be deposited from a solution of  $CaCl_2$  by a current of 5mA flowig for 60s?

A.  $4.68 \times 10^{18}$

B.  $4.68 \times 10^{15}$

C.  $4.68 \times 10^{12}$

D.  $4.68 \times 10^9$

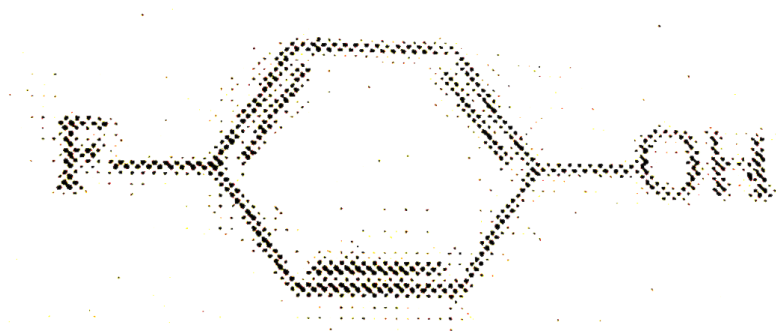
**Answer: A**



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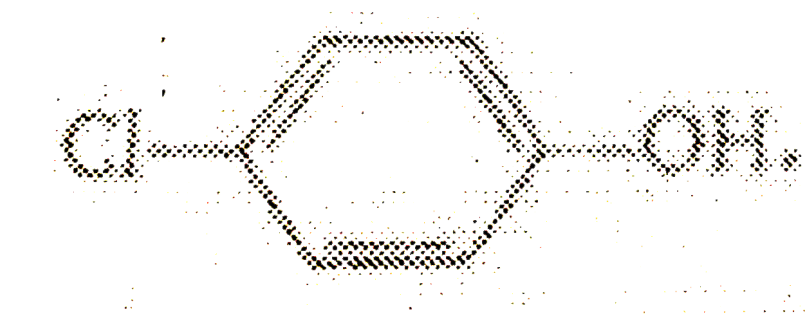
41.

Assertion:



is less

acidic than



Reason: -F exerts better +mesomeric effect than -Cl.

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

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

**Answer: A**



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**42.** Assertion: Phenoxide ion treatment with active alkyl halide (e.g.,  $CH_2 = CH - CH_2Cl$ ) gives two products viz. O-substituted and C-substituted.

Reason: Phenoxide ion is an ambident nucleophile.

- A. If both assertion and Reason are true and the Reason is the correct explanation of the assertion.
- B. If both assertion and Reason are true but the reason is not the correct explanation of the 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: K, Rb and Cs form superoxides.

Reason: The stability of the superoxides increases from 'K' to 'Cs' due to decrease in lattice energy.

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

**Answer: C**

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**44.** Assertion: A catalyst increases the rate of a reaction.

Reason: In presence of a catalyst, the activation energy of the reaction decreases.

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

**Answer: D**

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**45.** Assertion (*A*):  $NaCl$  is less soluble in heavy water than in ordinary water.

Reason (*R*) : Dielectric constant of ordinary water is more than that of heavy water.

- A. If both assertion and Reason are true and the Reason is the correct explanation of the assertion.
- B. If both assertion and Reason are true but the reason is not the correct explanation of the 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: Equal moles of different substances contains same number of constituent particles.

Reason: Equal weights of different substances contain the same number of constituent particles.



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

**Answer: C**

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**47.** Assertion: The catalytic converted in the car's exhaust system converts polluting exhaust gases into non-toxic gases.

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

**Answer: A**

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**48.** Assertion: As a lead storage battery gets discharged, density of electrolyte, present in it, decreases.

Reason: lead and lead dioxide both react with sulphuric acid to form lead sulphate.

- A. If both assertion and Reason are true and the Reason is the correct explanation of the assertion.
- B. If both assertion and Reason are true but the reason is not the correct explanation of the 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: Atomic size of silver is almost equal to that of gold.

Reason: d-subshell has low penetration power and produce poor shielding.

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

**Answer: B**



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**50.** Assertion (A): Larger the value of cryoscopic constant of the solvent, lesser will be the freezing point of the solution.

Reason (R ): Depression in the freezing point depends on the nature of the solvent.

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

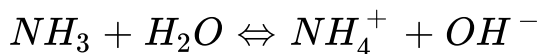
**Answer: D**



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**51.** Assertion: The dissolution of ammonia in water does not follow Henry's law.

Reason: Ammonia undergoes ionisation in water as



- A. If both assertion and Reason are true and the Reason is the correct explanation of the assertion.
- B. If both assertion and Reason are true but the reason is not the correct explanation of the 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:  $H_2$  molecule is more stable than  $HeH$  molecule.  
Reason: the anti-bonding electron in the molecule destabilise it.

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

**Answer: B**

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**53.** Assertion (A):  $pH$  of neutral solution is always 7.

Reason (R) :  $pH$  of solution does not depend upon temperature.

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

**Answer: D**

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**54.** Assertion(A): In chemisorption, adsorption keeps on increasing with temperature.

Reason(R): Heat keeps on providing more and more activation energy.



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

**Answer: D**



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**55.** Assertion: The first ionisation energy of  $Be$  is greater than that of  $B$ .

Reason: 2p-orbital is lower in energy than 2s-orbital.

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

**Answer: C**



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**56.** Assertion: Nitriding is a process of heating steel in an atmosphere of nitrogen.

Reason: Steel becomes brittle after nitriding.

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

**Answer: D**



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**57.** Assertion: Both grignard reagent and dialkyl cadmium react with acid chlorides to form tert-alcohols.

Reason: Grignard reagents are as reactive as dialkyl cadmium.

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

**Answer: D**

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- 58.** (a) If both assertion and reason are true and the reason is the correct explanation of the assertion of the assertion.
- (b) If both assertion and reason are true but reason is not the correct explanation of the assertion.

(c) If assertion is true but reason is false.

(d) If assertion is false but reason is true.

Q. Assertion: Methyl cyanide has higher boiling point than methyl isocyanide.

Reason: Dipole moment of methyl cyanide is higher than that of methyl isocyanide.

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

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

C. If assertion is true but reason is false

D. If both assertion and reason are false.

**Answer: A**



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**59.** Assertion : Aspirin can cause ulcer in stomach when taken empty stomach.

Reason : Aspirin gets hydrolysed to salicylic acid in stomach where  $pH$  is 2.

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

**Answer: A**



**60.** Assertion: p-Dichlorobenzene is less soluble in organic solvents than the corresponding o-isomer

Reason o-Dichlorobenzene is polar while p-dichlorobenzene is non-polar .

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

**Answer: B**



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