**AIEEE Previous Years Papers**

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| [AIEEE Paper](http://www.askiitians.com/aieee/AIEEE-Past-Papers) > 2008-Chemistry**AIEEE 2008 Chemistry**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **1)**     The ionization enthalpy of hydrogen atom is 1.312 X 106 J mol-1. The energy required to excite the electron in the atom from n = 1 to n = 2 isA)    6.56 X 105 J mol-1B)    7.56 X 105 J mol-1C)    9.84 X 105 J mol-1D)    8.51 X 105 J mol-1  **2)**     Which one of the following pairs of species have the same bond order?A)    CN- and CN+B)    O2- and CN-C)    NO+ and CN+D)    CN- and NO+ **3)**     Which one of the following constitutes a group of the isoelectronic species?A)   NO+, C22- , CN-, N2B)   CN-, N2, O22-, C22-C)   N2, O2- , NO+ , COD)   C22-, O2-, CO, NO **4)**   Four species are listed below:i. HCO3-ii. H3O+iii. HSO4-iv. HSO3FWhich one of the following is the correct sequence of their acid strength?A)   ii < iii < i < ivB)   i < iii < ii< ivC)   iii < i < iv < iiD)   iv < ii < iii < i  **5)**   The pKa of a weak acid, HA, is 4.80. The pKb of a weak base, BOH, is 4.78. The pH of an aqueous solution of the corresponding salt, BA, will beA)   4.79B)   7.01C)   9.22D)   9.58 **6)**    The correct decreasing order of priority for the functional groups of organic compounds in the IUPAC system of nomenclature isA)   -SO3H , -COOH , -CONH2 , -CHOB)   -CHO , -COOH , -SO3H , -CONH2C)   -CONH2 , -CHO , -SO3H , -COOHD)   -COOH, -SO3H, -CONH2, -CHO |

**7)**  The treatment of CH3MgX with CH3C ≡ C - H produces

A)   CH3C ≡ C - CH3

             H  H

             |   |

B)   CH3-C=C-CH3

C)   CH4

D)   CH3 - CH = CH2

**8)**    The hydrocarbon which can react with sodium in liquid ammonia is

A)   CH3CH2C ≡ CH

B)   CH3CH = CHCH3

C)   CH3CH2C ≡ CCH2CH3

D)   CH3CH2CH2C ≡ CCH2CH2CH3

**9)**     The vapour pressure of water at 20° C is 17.5 mm Hg. If 18g of glucose (C6H12O6) is added to 178.2 g of water at 20° C, the vapour pressure of the resulting solution will be

A)   15.750 mm Hg

B)   16.500 mm Hg

C)   17.325 mm Hg

D)   17.675 mm Hg

**10)**    Gold numbers of protective colloids A, B, C and D are 0.50, 0.01, 0.10 and 0.005, respectively. The correct order of their protective powers is

A)   C < B < D < A

B)   A < C < B < D

C)   B < D < A < C

D)   D < A < C < B

**11)**    In a compound, atoms of element Y form ccp lattice and those of element X occupy 2/3rd of tetrahedral voids. The formula of the compound will be

A)   X2Y3

B)   X2Y

C)   X3Y4

D)   X4Y3

**12)**    In context with the industrial preparation of hydrogen from water gas (CO + H2), which of the following is the correct statement?

A)   CO is removed by absorption in aqueous Cu2Cl2 Solution

B)   H2 is removed through occlusion with Pd

C)   CO is oxidized to CO2 with steam in the presence of a catalyst followed by absorption of CO2 in alkali

D)   CO and H2 are fractionally separated using differences in their densities

**13)**    Among the following substituted silanes the one which will give rise to cross linked silicone polymer on hydrolysis is

A)   RSiCl3

B)   R2SiCl2

C)   R3SiCl2

D)   R4Si

**14)**    Amount of oxalic acid present in a solution can be determined by its titration with KMnO4 solution in the presence of H2SO4. The titration gives unsatisfactory result when carried out in the presence of HCl, because HCl

A)   furnishes H+ ions in addition to those from oxalic acid

B)   reduces permanganate to Mn2+

C)   oxidises oxalic acid to carbon dioxide and water

D)   gets oxidised by oxalic acid to chlorine

**15)**   Given E0Cr3+/Cr = - 0.72 V , E0Fe2+/Fe = - 0.42 V .

The potential for the cell Cr |Cr3+ (0.1 M) | |Fe2+ (0.01 M) | Fe is

A)   0.339 V

B)   - 0.339 V

C)   - 0.26

D)   0.26 V

**16)**   Which one of the following is the correct statement?

A)   Beryllium exhibits coordination number of six

B)   Chlorides of both beryllium and aluminium have bridged chloride structures in solid phase

C)   B4H6.2NH3 is known as 'inorganic benzene'

D)   Boric acid is a protonic acid

**17)**   Identify the wrong statement in the following:

A)   Greenhouse effect is responsible for global warming

B)   Ozone layer does not permit infrared ratiation from the sun to reach the earth

C)   Acid rain is mostly because of oxides of nitrogen and sulphur

D)   Chlorofluorocarbons are responsible for ozone layer depliction

**18)**    The coordination number and the oxidation state of the element 'E' in the complex [E(en)2(C2O4)] NO2 (when (en) is ethylene diamine) are, respectively,

A)   4 and 2

B)   4 and 3

C)   6 and 3

D)   6 and 2

**19)**   In which of the following octahedral complexes of Co (at no. 27), will the magnitude of Δ0 be the highest?

A)   [ Co(C2O4)3 ]3-

B)   [ Co(H2O )6 ]3+

C)   [ Co(NH3 )6 ]3+

D)   [ Co(CN)6 ]3-

**20)**    Larger number of oxidation states are exhibited by the actinoids than those by the lanthanoids, the main reason being

A)   lesser energy difference between 5f and 6d than between 4f and 5d orbitals

B)   more energy difference between 5f and 6d than between 4f and 5d orbitals

C)   more reactive nature of the actinoids than the lanthanoids

D)   4f orbitals more diffused than the 5f orbitals

**21)**   Which of the following factors is of no significance for roasting sulphide ores to the oxides and not subjecting the sulphide ores to carbon reduction directly?

A)   CO2 is thermodynamically more stable than CS2

B)   Metal sulphides are less stable than the corresponding oxides

C)   CO2 is more volatile than CS2

D)   Metal sulphides are thermodynamically more stable than CS2

**22)**   Oxidising power of chlorine in aqueous solution can be determined by the parameters indicated below:



The energy involved in the conversion of



A)   - 610 kJ mole-1

B)   - 850 kJ mole-1

C)   + 120 kJ mole-1

D)   + 152 kJ mole-1

**23)**   In the following sequence of reactions, the alkene affords the compound 'B'



The compound B is

A)   CH3COCH3

B)   CH3CH2COCH3

C)   CH3CHO

D)   CH3CH2CHO

**24)**   Phenol, when it first reacts with concentrated sulphuric acid and then with concentrated nitric acid, gives

A)   o-nitrophenol

B)   p-nitrophenol

C)   nitrobenzene

D)   2,4,6-trinitrobenzene

**25)**   Toluene is nitrated and the resulting product is reduced with tin and hydrochloric acid. The product so obtained is diazotised and then heated with cuprous bromide. The reaction mixture so formed contains

A)   mixture of o- and p-dibromobenzenes

B)   mixture of o- and p-bromoanilines

C)   mixture of o- and m-bromotoluenes

D)   mixture of o- and p-bromotoluenes

**26)**  The organic chloro compound, which shows complete stereochemical inversion during a SN2 reaction , is

A)   (CH3)3CCl

B)   (CH3)2CHCl

C)   CH3Cl

D)   (C2H5)2CHCl

**27)**   The absolute configuration of



A)   R, R

B)   R, S

C)   S, R

D)   S, S

**28)**  α-D-(+)-glucose and β-D-(+)-glucose are

A)   epimers

B)   anomers

C)   enantiomers

D)   conformers

**29)**   The electrophile, E⊕ attacks the benzene ring to generate the intermediate σ-complex. Of the following, which σ-complex is of lowest energy?



**30)**  Standard entropy of X2, Y2 and XY3 are 60, 40 and 50 J K-1 mol-1, respectively. For the reaction, 1/2 X2 + 3/2 Y2 → XY3 ΔH - -30 kJ, to be at equilibrium, the temperature will be

A)   500 K

B)   750 K

C)   1000 K

D)   1250 K

**31)**   For the following three reactions a, b and c, equilibrium constants are given:

(1) CO(g) + H2O(g) <--> CO2(g) + H2(g); K1

(2) CH4(g) + H2O(g) <--> CO (g) + 3H2(g); K1

(3) CH4(g) + 2H2O(g) <--> CO2(g) + 4H2(g); K3

Which of the following relations is correct ?

A)   K2 K3 = K1

B)   K3 = K1 K2

C)   K3 K23 = K12

D)   K1√ K2  = K3

**32)**    Bakelite is obtained from phenol by reacting with

A)   CH3CHO

B)   CH3COCH3

C)   HCHO

D)   (CH2OH)2

**33)**   The equilibrium constants Kp1 and Kp2 for the reactions X<-->2Y and
Z<-->P + Q, respectively are in the ratio of 1 : 9. If the degree of dissociation of X and Z be equal then the ratio of total pressures at these equilibria is

A)   1 : 1

B)   1 : 3

C)   1 : 9

D)   1 : 36

**34)**   For a reaction rate of disappearance of 'A' related to the rate of appearance of 'B' by the 1/2 A → 2B,

        A)  - d[A]/dt = 1/4 \* d[B]/dt

        B)  - d[A]/dt =  d[B]/dt

        C)  - d[A]/dt = 1/4 \* d[B]/dt

        D)  - d[A]/dt = 4 \* d[B]/dt

**35)**   At 80° C , the vapour pressure of pure liquid 'A' is 520 mm Hg and that of pure liquid 'B' is 1000 mm Hg. If a mixture solution of 'A' and 'B' boils at 80° C and 1 atm pressure, the amount of 'A' in the mixture is (1 atm = 760 mm Hg)

A)   34 mol percent

B)   48 mol percent

C)   50 mol percent

D)   52 mol percent