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Previous Year Paper

Chemistry - 2017

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Multiple Choice Questions

1. The reaction quotient 'Q' is useful in predicting the direction of the reaction. Which of the following is incorrect?
- A. If $Q_c < K_c$, the forward reaction is favoured
 - B. If $Q_c > K_c$, the forward reaction is favoured
 - C. If $Q_c > K_c$, the forward reaction is favoured and $Q_c = K_c$, no reaction occur.
 - D. None of these

Answer

2. Which of the following structure of a molecule is expected to have three bond pairs and one lone pair of electrons?
- A. Octahedral
 - B. Trigonal planar
 - C. Pyramidal
 - D. Tetrahedral

Answer

3. A reaction has both ΔH and ΔS -ve. The rate of reaction
- A. increases with increases in temperature
 - B. cannot be predicted for change in temperature
 - C. increases with decreases in temperature
 - D. remains unaffected by change in temperature

Answer

4. The correct set of quantum number for the unpaired electrons of chlorine atoms is
- A. 2, 1, -1, +1/2
 - B. 2, 0, 0, + 1/2
 - C. 3, 1, 1, $\pm 1/2$
 - D. 3, 0, 0, $\pm 1/2$

Answer

5. The equilibrium constant for the reaction $N_2(g) + O_2(g) \rightleftharpoons 2NO(g)$ is 4×10^{-4} at 200K. In presence of a catalyst the equilibrium is attained ten times faster. Therefore the equilibrium constant in presence of catalyst 2000 K is
- A. 4×10^{-3}
 - B. 4×10^{-2}

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Answer

6. Which of the following is correct electron dot structure of N_2O molecule?

- A. $:N=N=\ddot{O}:$
- B. $:N\equiv N+-O....:$
- C. $:N..=N=O....$
- D. $:N..=N-O....$

Answer

7. If 3.01×10^{20} molecules are removed from 98 mg of H_2SO_4 , then number of moles of H_2SO_4 left are

- A. 0.1×10^{-3} mol
- B. 9.95×10^{-2} mol
- C. 0.5×10^{-3} mol
- D. 1.66×10^{-3} mol

Answer

8. The electronegativities of C, N, Si and P are in the order of

- A. $P < Si < C < N$
- B. $Si < P < C < N$
- C. $P < Si < N < C$
- D. $Si < P < N < C$

Answer

9. Addition of mineral acid to an aqueous solution of borax, the following compound is formed

- A. pyroboric acid
- B. boron hydride
- C. meta boric acid
- D. orthoboric acid

Answer

10. Which one of the following is not a common component of photo-chemical smog?

- A. Ozone
- B. Acrolein
- C. Peroxy acetyl nitrate
- D. Chloroflourocarbons

Answer

11. In which of the following, homolytic bond fission takes place?

- A. Free radical chlorination of methane
- B. Addition of HBr to double bond

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Answer

12. Which of the following metallic oxide exhibit amphoteric nature?

- A. CaO
- B. Al_2O_3
- C. Na_2O
- D. BaO

Answer

13. Pick the correct statement among the following statement.

- A. Sodium dodecyl benzene sulphonate used in tooth paste is a cationic detergent
- B. Non-ionic detergents is formed when polyethylene glycol reacts with adipic acid
- C. Cetyl trimethyl ammonium bromide is a popular cationic detergent used in air conditioner
- D. Sodium lauryl sulphate forms an insoluble scum with hard water

Answer

14. $3\text{ClO}^-(\text{aq}) \rightarrow \text{ClO}^- + 2\text{Cl}$ is an example of

- A. Oxidation reaction
- B. reduction reaction
- C. disproportionation reaction
- D. decomposition reaction

Answer

15. In the manufacture of hydrogen from water gas ($\text{CO} + \text{H}_2$), which of the following is correct statement?

- A. CO and H_2 are separated based on difference in their densities
- B. H_2 is removed by occlusion with Pd
- C. CO is oxidised to CO_2 with steam in the presence of a catalyst followed by absorption of CO_2 alkali
- D. Hydrogen is isolated by diffusion

Answer

16. Plaster of Paris is represented as

- A. $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$
- B. CaSO_4
- C. $\text{CaSO}_4 \cdot \text{H}_2\text{O}$
- D. $\text{CaSO}_4 \cdot 12\text{H}_2\text{O}$

Answer

17. Square planar complex of the type M_{AXBL} (where A, B, X and L) are unidentate ligands) shows following set of isomers.

- A. two cis and one trans

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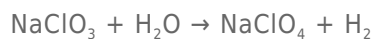
C. two cis and two trans

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D. three cis and one trans

Answer

18. By passing electric current, NaClO_3 is converted in to NaClO_4 according to the following equation



How many moles of NaClO_4 will be formed when three Faradays of charges is passed through NaClO_3 ?

- A. 3.0
- B. 1.5
- C. 0.75
- D. 1.0

Answer

19. The pressure of real gases is less than that of ideal gas because of

- A. increases in the kinetic energy of the molecules
- B. increases in the number of collisions
- C. intermolecular attraction
- D. finite size of particles

Answer

20. In a face centred cubic arrangement of A and B atoms in which 'A' atoms are at the corners of the unit cell and 'B' atoms are at the face centres. One of the 'A' atoms is missing from one corner in unit cell. The simplest formula of compounds is

- A. A_7B_8
- B. A_7B_3
- C. AB_3
- D. A_7B_{24}

Answer

21. Which of the following statement is incorrect?

- A. The rate of law for any reaction cannot be determined experimentally
- B. Complex reactions have fractional order
- C. Biomolecular reactions involved simultaneous collision between two species
- D. Molecularity is only applicable for elementary reaction

Answer

22. Which of the following elements forms $\text{p}\pi\text{-p}\pi$ bond with itself?

- A. P
- B. Se
- C. N

D. Te

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23. Which of the following statement is in accordance with the Arrhenius equations?

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- A. Rate of reaction does not change with increase in activation energy
- B. Rate constant decreases exponentially with increase in temperature
- C. Rate of a reaction increases with increases in temperature and decreases in activation energy
- D. none of these

Answer

24. The magnetic nature of elements depends on the presence of unpaired electrons. Identify the configuration of transition elements which shows highest magnetic moment?

- A. $3d^7$
- B. $3d^8$
- C. $3d^5$
- D. $3d^2$

Answer

25. The process which is responsible for the formation of delta at a place where rivers meets the sea is

- A. Coagulation
- B. Colloid formation
- C. peptisation
- D. emulsification

Answer

26. Extraction of chlorine from brine solution based on

- A. Oxidation
- B. acidification
- C. chlorination
- D. reduction

Answer

27. Which of the following is not a favourable condition for physical adsorption?

- A. High temperature
- B. High pressure
- C. Higher critical temperature of adsorbate
- D. low temperature

Answer

28. The correct statement regarding defect in solids is

- A. Frenkel defect is usually favoured by a very small difference in the sizes of cations and anions.
- B. Frenkel defect is a dislocation defect
- C. Trapping of proton in the lattice leads to the formation of F-centres.

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Answer

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29. According to crystal field theory, the M-L bond in a complex is

- A. partially covalent
- B. purely ionic
- C. purely covalent
- D. purely coordinate

Answer

30. Which of the following crystal has unit cell such that $a \neq b \neq c$ and $\alpha \neq \beta \neq \gamma \neq 90^\circ$?

- A. NaNO_3
- B. K_2SO_4
- C. KNO_3
- D. $\text{K}_2\text{Cr}_2\text{O}_7$

Answer

31. Which of the following statement is wrong regarding lanthanoids?

- A. Ln(III) compounds are predominantly ionic in character.
- B. Ln(III) compound are generally colourless
- C. Ln(III) hydroxide are mainly basic in nature
- D. The ionic size of Ln(III) ions decreases with increasing atomic number.

Answer

32. The vant Hoffs factor 'i' accounts for

- A. extend of solubility
- B. extent of mobility of solute
- C. extent of dissolution of solute
- D. extent of dissociation of solute

Answer

33. Which one of the following noble gas has an unusual property of diffusing through the materials such as rubber, glass or plastic?

- A. Kr
- B. Ne
- C. Ar
- D. He

Answer

34. When the pure solvent diffuses out of the solution through the semi-permeable membrane then the process is called

- A. sorption
- B. dialysis
- C. reverse osmosis

D. osmosis

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35. Hydrogenation of vegetable oils in presence of finely divided nickel as catalyst. The reaction is

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- A. enzyme catalysed reaction
- B. homogeneous catalysis
- C. heterogeneous catalysis
- D. liquid catalysed reaction

Answer

36. Which of the following aqueous solution has highest freezing point?

- A. 0.1 molal $\text{Al}_2(\text{SO}_4)_3$
- B. 0.1 molal BaCl_2
- C. 0.1 molal AlCl_3
- D. 0.1 molal NH_4Cl

Answer

37. In the electrolysis of aqueous sodium chloride solution, which of the half cell reaction will occur at anode?

- A. $2\text{H}_2\text{O}(\text{l}) \rightarrow \text{O}_2 + 4\text{H}^+ + 4\text{e}^-$, $E_{\text{cell}}^\circ = +1.23\text{V}$
- B. $2\text{H}^+(\text{aq}) + \text{e}^- \rightarrow 1/2\text{H}_2$, $E_{\text{cell}}^\circ = -0.00\text{V}$
- C. $\text{Na}^+(\text{aq}) + \text{e}^- \rightarrow \text{Na}(\text{s})$, $E_{\text{cell}}^\circ = -2.71\text{V}$
- D. $\text{Cl}^-(\text{aq}) \rightarrow 1/2 \text{Cl}_2 + \text{e}^-$, $E_{\text{cell}}^\circ = 1.36\text{V}$

Answer

38. The metal extracted by leaching with a cyanide is

- A. Al
- B. Na
- C. Cu
- D. Ag

Answer

39. Select wrong chemical reaction among the following.

- A. $8\text{NH}_3 + 3\text{Cl}_2 \rightarrow 6\text{NH}_4\text{Cl} + \text{N}_2$
- B. $2\text{Ca}(\text{OH})_2 + \text{Cl}_2 \rightarrow \text{Ca}(\text{OCl})_2 + \text{CaCl}_2 + 2\text{H}_2\text{O}$
- C. $2\text{NaOH} + \text{Cl}_2 \rightarrow 2\text{NaCl} + \text{H}_2 + \text{O}_2$
- D. $\text{MnO}_2 + 4\text{HCl} \rightarrow \text{MnCl}_2 + \text{Cl}_2 + 2\text{H}_2\text{O}$

Answer

40. The standard reduction potential at 298K the following half cell reaction.



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Which of the following is strongest reducing agent?

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- A. $\text{Zn}(\text{s})$
- B. $\text{Cr}(\text{s})$
- C. $\text{H}_2(\text{g})$
- D. $\text{F}_2(\text{g})$

Answer

41. For a reaction $\frac{1}{2}\text{A} \rightarrow 2\text{B}$ rate of disappearance of A is related to rate of appearance of B by the expression.

- A. $-\frac{d[\text{A}]}{dt} = 12\frac{d[\text{B}]}{dt}$
- B. $-\frac{d[\text{A}]}{dt} = 4\frac{d[\text{B}]}{dt}$
- C. $-\frac{d[\text{A}]}{dt} = \frac{d[\text{B}]}{dt}$
- D. $-\frac{d[\text{A}]}{dt} = 14\frac{d[\text{B}]}{dt}$

Answer

42. The coordination number and the oxidation state of the element 'M' in the complex $[\text{M}(\text{en})_2(\text{C}_2\text{O}_4)]\text{NO}_2$ {where (en) is ethan 1, 2-diamine} are respectively

- A. 6 and 3
- B. 4 and 3
- C. 6 and 2
- D. 4 and 2

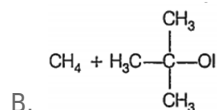
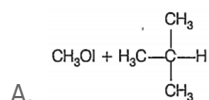
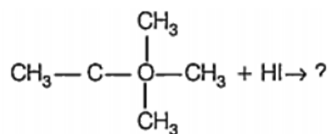
Answer

43. Which of the following reagent cannot be used to oxidise primary alcohols to aldehydes?

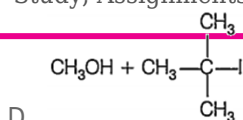
- A. Pyridinium chlorochromate
- B. KMnO_4 in acidic medium
- C. CrO_3 in anhydrous medium
- D. Heating in presence of Cu at 573K

Answer

44. The product formed during the following reaction are



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Answer

45. Bactericidal antibiotics among the following is

- A. tetracycline
- B. erythromycin
- C. ofloxacin
- D. chloromphenicol

Answer

46. Which of the following is not a biodegradable polymer?

- A. Glyptol
- B. Polyhydroxy butyrate-CO- β -hydroxy valerate
- C. PHBV
- D. Nylon 2-nylon-6

Answer

47. Reduction of ketones cannot be carried out with which of the following reagents?

- A. Sodium borohydride or lithium aluminium hydride
- B. Zinc amalgam and conc.HCl
- C. Hydrazine and KOH in ethylene glycol
- D. Hydrogen in presence of palladium in barium sulphate and quinoline

Answer

48. Toluene reacts with halogen in presence of iron (III) chloride giving ortho and para halo compounds. The reaction is

- A. nucleophilic substitution reaction
- B. free radical addition reaction
- C. electrophilic elimination reaction
- D. electrophilic substitution reaction

Answer

49. The correct order of increasing basic nature for the bases NH_3 , CH_3NH_2 and $(\text{CH}_3)_2\text{NH}$ in aqueous solution

- A. $\text{CH}_3\text{NH}_2 < \text{NH}_3 < (\text{CH}_3)_2\text{NH}$
- B. $\text{NH}_3 < \text{CH}_3\text{NH}_2 < (\text{CH}_3)_2\text{NH}$
- C. $\text{CH}_3\text{NH}_2 < (\text{CH}_3)_2\text{NH} < \text{NH}_3$
- D. $(\text{CH}_3)_2\text{NH} < \text{NH}_3 < \text{CH}_3\text{NH}_2$

Answer

50. The glycosidic linkage present in Maltose is between

A. C-1 of α -glucose and C-4 of α -glucose

B. C-1 of α -glucose and C-4 of β -fructose

C. C-1 of α -glucose and C-4 of α -glucose

D. C-1 of α -glucose and C-2 of β -fructose

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Answer

51. Lower members of aliphatic carboxylic acid are soluble in water. This is due to

A. formation of hydrogen bonds with water

B. due to london forces

C. water is non electrolyte

D. Van der- Waal's interaction with water molecules.

Answer

52. Hormones are secreted by ductless glands of human body. Iodine containing hormone is

A. Adrenoline

B. Thyroxine

C. Testosterone

D. Insulin

Answer

53. Cannizzaro's reaction is an example of auto oxidation

A. It is a reaction answered by only aldehydes containing a hydrogen

B. It is a reaction answered only by aromatic aldehydes.

C. it is a reaction answered by all aldehydes

D. it is a reaction answered by all aldehydes

Answer

54. Pick the wrong statements from the following.

A. Deficiency of vitamin B6 (pyridoxime) results in convulsions.

B. Sources of vitamin are yeast, milk, green vegetables and cereals.

C. deficiency of vitamin D cause xerophthalmia

D. Consumption of citrus fruits and green leafy vegetables in food prevents scurvy.

Answer

55. Which of the following order is true regarding the acidic nature of phenol?

A. Phenol < o-cresol < o-nitrophenol

B. Phenol > o-cresol > o-nitrophenol

C. Phenol < o-cresol > o-nitrophenol

D. o-cresol < phenol < o-nitrophenol

Answer

56. Identify the correct statement in the following

A. n-butane and isobutane are functional isomers

B. Propan-1-ol and propan-2-ol are position isomers

C. Dimethyl ether and ethanol are chain isomers

D. Ethanoic acid and methyl methanoate are position isomers.

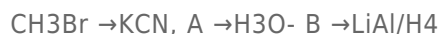
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57. Gabriel phthalimide synthesis is used in the preparation of primary amine from phthalimide, which of the following reagent is not used during the process?

- A. KOH
- B. NaOH
- C. HCl
- D. Alkyl halides

Answer

58. In the following sequence of reactions



The end product C is

- A. acetone
- B. ethyl alcohol
- C. methane
- D. acetaldehyde

Answer

59. The monomer used in novolac, a polymer used in paints

- A. melamine and formaldehyde
- B. phenol and formaldehyde
- C. butadiene and acrylo nitrile
- D. butadiene and styrene

Answer

60. For the preparation of alkanes, aqueous solution of sodium or potassium salt of carboxylic acid is subjected to

- A. hydrolysis
- B. electrolysis
- C. hydrogenation
- D. oxidation

Answer