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Previous Year Paper

Chemistry - 2010



Multiple Choice Questions

1. Electronic configuration of H^+ is

- A. $1s^0$
- B. $1s^1$
- C. $1s^2$
- D. $1s^1, 2s^1$

Answer

2. From the given sets of quantum numbers, the one that is inconsistent with the theory is

- A. $n=3; l=2; m=-3; s=+1/2$
- B. $n=4; l=3; m=3; s=+1/2$
- C. $n=2; l=1; m=0; s=-1/2$
- D. $n=4; l=3; m=2; s=+1/2$

Answer

3. Pick out the isoelectronic structures from the following

CH_3^+ I H_3O^+ II NH_3 III CH_3^- IV

- A. I and II
- B. I and IV
- C. I and III
- D. II, III and IV

Answer

4. Which of the following species is paramagnetic?

- A. CN^-
- B. NO
- C. O_2^{2-}
- D. CO

Answer

5. XeF_4 has a shape of

- A. spherical
- B. trigonal bipyramidal
- C. square planar
- D. tetrahedral

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A. 0.1 M

B. 0.2 M

C. 0.3 M

D. 0.4 M

Answer

7. Molality of a solution is equal to

A. number of moles of solutenumber of litres of solution

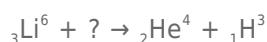
B. number of g-equivalents of solutenumber of litres of solution

C. number of moles of solutenumber of kilogram of solvent

D. number of moles of a componenttotal number of moles of all components

Answer

8. In the following particle



the missing particle is

A. electron

B. neutron

C. proton

D. deuteron

Answer

9. Consider the two gaseous equilibria involving SO_2 and the corresponding equilibrium constants at 298 K



The values of the equilibrium constants are related by

A. $K_2 = K_1$

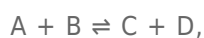
B. $K_2 = K_1^2$

C. $K_2 = 1/K_1^2$

D. $K_2 = 1/K_1$

Answer

10. For the reaction,



the initial concentrations of A and B are equal. The equilibrium concentration of C is two times the equilibrium concentration of A. The equilibrium constant is

A. 4

B. 1/4

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D. 19

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11. The pOH of a solution is 6.0. Its pH will be

- A. 6
- B. 8
- C. 0
- D. 14

Answer

12. Solubility products of $\text{Al}(\text{OH})_3$ and $\text{Zn}(\text{OH})_2$ are 8.5×10^{-23} and 1.8×10^{-4} respectively. If both Al^{3+} and Zn^{2+} ions are present in a solution, which one will be precipitated first on addition of NH_4OH ?

- A. $\text{Al}(\text{OH})_3$
- B. $\text{Zn}(\text{OH})_2$
- C. Both (a) and (b)
- D. None of these

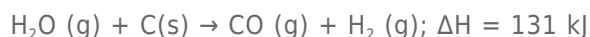
Answer

13. In a reversible isothermal process, the change in internal energy is

- A. zero
- B. positive
- C. negative
- D. None of these

Answer

14. Based on the following thermochemical equations



the value of X will be

- A. -393 kJ
- B. -655 kJ
- C. +393 kJ
- D. +655 kJ

Answer

15. The sky looks blue due to

- A. dispersion effect
- B. reflection
- C. transmission

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[Answer](#)

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16. The first ionisation potential of Na, Mg, Al and Si are in the order

- A. $\text{Na} < \text{Mg} > \text{Al} < \text{Si}$
- B. $\text{Na} > \text{Mg} > \text{Al} > \text{Si}$
- C. $\text{Na} < \text{Mg} < \text{Al} > \text{Si}$
- D. $\text{Na} > \text{Mg} > \text{Al} < \text{Si}$

[Answer](#)

17. Elements of which group form anions most readily?

- A. Oxygen group
- B. Nitrogen group
- C. Halogens
- D. Alkali metals

[Answer](#)

18. Which of the following is paramagnetic?

- A. $[\text{Ni}(\text{CO})_4]^{2+}$
- B. $[\text{Co}(\text{NH}_3)_6]^{2+}$
- C. $[\text{Ni}(\text{CN})_4]^{2-}$
- D. $[\text{NiCl}_4]^{2-}$

[Answer](#)

19. Which of the following elements is present in red blood cells of man?

- A. Fe
- B. Ra
- C. Co
- D. None of these

[Answer](#)

20. The weakest acid among the following is

- A. CH_3COOH
- B. CH_2ClCOOH
- C. CHCl_2COOH
- D. CCl_3COOH

[Answer](#)21. The IE of hydrogen atom is 13.6 eV. The energy required to remove an electron in the $n = 2$ state of the hydrogen atom is

- A. 27.2 eV
- B. 13.6 eV
- C. 6.8 eV

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22. When conc. H_2SO_4 comes in contact with sugar, it becomes black due to
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A. hydrolysis

B. hydration

C. decolourisation

D. dehydration

Answer

23. The complex $[\text{Co}(\text{ONO})(\text{NH}_3)_5]\text{SO}_4$ is named as

A. nitropentamminecobalt (III) sulphate

B. nitropentamminecobalt (II) sulphate

C. nitritopentamminecobalt (III) sulphate

D. pentamminenitritocobalt (III) sulphate

Answer

24. Prussian blue is formed when

A. ferrous sulphate reacts with FeCl_3

B. ferric sulphate reacts with $\text{K}_4[\text{Fe}(\text{CN})_6]$

C. ferrous ammonium sulphate reacts with FeCl_3

D. ammonium sulphate reacts with FeCl_3

Answer

25. IUPAC name of the following compound is

A. 2-cyclohexylbutane

B. 2-phenylbutane

C. 3-cyclohexylbutane

D. 3-phenylbutane

Answer

26. Which are isomers?

A. Methanol and methoxymethane

B. Ethanol and ethoxyethane

C. Propionic acid and ethyl acetate

D. Propionaldehyde and acetone

Answer

27. The compound $\text{X}(\text{C}_5\text{H}_8)$ reacts with ammoniacal AgNO_3 to give a white precipitate and reacts with excess of KMnO_4 to give the acid, $(\text{CH}_3)_2\text{CH}\cdot\text{COOH}$. Therefore, X is

A. $\text{CH}_2 = \text{CH} - \text{CH} = \text{CH} - \text{CH}_3$

B. $\text{CH}_3(\text{CH}_2)_2\text{C} \equiv \text{CH}$

C. $(\text{CH}_3)_2\text{CH}\cdot\text{C} \equiv \text{CH}$

D. $(\text{CH}_3)_2\text{C} = \text{C} = \text{CH}_2$

Answer

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A. Ag^+

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B. Li^+ C. Cu^{2+} D. Ba^{2+}

Answer

29. If we mix a pentavalent impurity in a crystal lattice of Ge, what type of semiconductor formation will occur?

A. p-type

B. n-type

C. Both (a) and (b)

D. None of these

Answer

30. The number of Na^+ ions filling all octahedral voids in NaCl structure is

A. 6

B. 12

C. 13

D. 14

Answer

31. The decay constant of a radioactive sample is λ . The half-life and mean life of the sample are, respectively

A. $1/\lambda$; $\ln 2/\lambda$ B. $\ln 2/\lambda$; $1/\lambda$ C. $\lambda \ln 2$; $1/\lambda$ D. $\lambda \ln 2$; $1/\lambda$

Answer

32. Which of the following is a first order reaction?

A. $\text{NH}_4\text{NO}_2 \rightarrow \text{N}_2 + 2\text{H}_2\text{O}$ B. $2\text{HI} \rightarrow \text{H}_2 + \text{I}_2$ C. $2\text{NO}_2 \rightarrow 2\text{NO} + \text{O}_2$ D. $2\text{NO} + \text{O}_2 \rightarrow 2\text{NO}_2$

Answer

33. In the reaction of $\text{A} + 2\text{B} \rightarrow \text{C} + 2\text{D}$, the initial rate $= -d[\text{A}]/dt$ at $t = 0$ was found to be $2.6 \times 10^{-2} \text{ M s}^{-1}$. What is the value of $-d[\text{B}]/dt$ at $t = 0$ in M s^{-1} ?

A. 2.6×10^{-2} B. 5.2×10^{-2}

Answer

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34. Copper sulphate solution is electrolysed using copper electrode. The reaction taking place at anode is

- A. $H^+ + e^- \rightarrow H$
- B. $SO_4^{2-} (aq) \rightarrow SO_4 + 2e^-$
- C. $Cu^{2+} + 2e^- \rightarrow Cu$
- D. $Cu (s) \rightarrow Cu^{2+} (aq) + 2e^-$

Answer

35. How many cc of oxygen will be liberated by 2 A current flowing for 3 min 13 s through acidulated water?

- A. 11.2 cc
- B. 33.6 cc
- C. 44.8 cc
- D. 22.4 cc

Answer

36. Which of the following will have the highest coagulating power for As_2S_3 colloid?

- A. PO_4^{3-}
- B. SO_4^{2-}
- C. Al^{3+}
- D. Na^+

Answer

37. Adsorption is multilayer in the case of

- A. physical adsorption
- B. chemisorption
- C. Both (a) and (b)
- D. None of the above

Answer

38. In blast furnace, iron oxide is reduced by

- A. silica
- B. CO
- C. C
- D. limestone

Answer

39. In electrorefining of metal, the impure metal is made the anode and a strip of pure metal the cathode during the electrolysis of an aqueous solution of a complex metal salt. This method cannot be used for refining of

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C. aluminium

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D. zinc

Answer

40. Hypochlorous acid is

- A. HOCl
- B. HClO_2
- C. HClO_3
- D. HClO_4

Answer

41. Which of the following radicals will not be precipitated by passing H_2S in concentrated acid solution?

- A. Copper
- B. Antimony
- C. Arsenic
- D. Cadmium

Answer

42. In which of the following solvents, AgBr will have the highest solubility?

- A. 10^{-3} M NaBr
- B. $10^{-3} \text{ M NH}_4\text{OH}$
- C. Pure water
- D. 10^{-3} M HBr

Answer

43. Which of the following compounds is oxidised to prepare methyl ethyl ketone?

- A. 2-propanol
- B. 1-butanol
- C. 2-butanol
- D. t-butyl alcohol

Answer

44. Identify Z in the following series



- A. $\text{CH}_2 = \text{CH}_2$
- B. $\text{CH}_3\text{-CH}_2\text{OH}$
- C. $\text{CH}_3\text{-CH}_2\text{-O-CH}_2\text{-CH}_3$
- D. None of the above

Answer

45. Base catalysed aldol condensation occurs with

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B. 2-methyl propionaldehyde

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C. 2, 2-dimethyl propionaldehyde

D. None of the above

Answer

46. Mark the correct statement.

A. Methylamine is slightly acidic

B. Methylamine is less basic than NH_3

C. Methylamine is stronger base than NH_3

D. Methylamine forms salt with alkalies

Answer

47. Which of the following statements about vitamin B_{12} is incorrect?

A. It has a cobalt atom.

B. It also occurs in plants.

C. It is also present in rain water.

D. It is needed for human body in very small amounts.

Answer

48. Which of the following food-stuffs contains nitrogen?

A. Carbohydrates

B. fats

C. Proteins

D. None of these

Answer

49. Glucose is obtained from

A. Starch

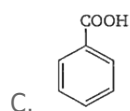
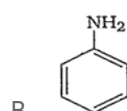
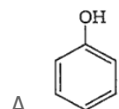
B. Molasses

C. Both (a) and (b)

D. None of these

Answer

50. Which among the following represents an amide?



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Answer
