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Previous Year Paper

Chemistry - 2013



Multiple Choice Questions

1. The number of radial nodes of 3s and 2p orbitals respectively are

- A. 0, 2
- B. 2, 0
- C. 1, 2
- D. 2, 1

Answer

2. The basis of quantum mechanical model of an atom is

- A. angular momentum of electron
- B. quantum numbers
- C. dual nature of electron
- D. black body radiation

Answer

3. The number of elements present in the fourth period is

- A. 32
- B. 8
- C. 18
- D. 2

Answer

4. Identify the correct set.

Molecule	Hybridisation of central atom	Shape
PCl_5	dsp^3	square pyramidal
$[\text{Ni}(\text{CN})_4]^{2-}$	sp^3	tetrahedral
SF_6	sp^3d^2	octahedral
IF_3	dsp^3	pyramidal

Answer

5. Which one of the following statements is correct?

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B. Lateral overlap of p-orbitals or p- and d-orbitals produces π -bonds.

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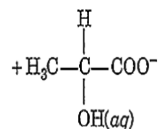
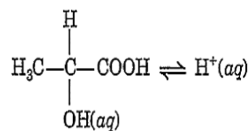
C. The strength of bonds follows the order

$$\sigma_{p-p} < \sigma_{s-s} < \pi_{p-p}$$

D. s-orbitals do not form σ bonds.

Answer

6. The degree of ionization of 0.10 M lactic acid is 4.0%



The value of K_c is

- A. 1.66×10^{-5}
B. 1.66×10^{-4}
C. 1.66×10^{-3}
D. 1.66×10^{-2}

Answer

7. The pH of a buffer solution made by mixing 25 mL of 0.02 M NH_4OH and 25 mL of 0.2 M NH_4Cl at 25° is (pK_b of $\text{NH}_4\text{OH} = 4.8$)
- A. 5.8
B. 8.2
C. 4.8
D. 3.8

Answer

8. For which one of the following reactions, the entropy change is positive?
- A. $\text{H}_2(\text{g}) + 12\text{O}_2(\text{g}) \rightarrow \text{H}_2\text{O}(\text{l})$
B. $\text{Na}^+(\text{g}) + \text{Cl}^-(\text{g}) \rightarrow \text{NaCl}(\text{s})$
C. $\text{NaCl}(\text{l}) \rightarrow \text{NaCl}(\text{s})$
D. $\text{H}_2\text{O}(\text{l}) \rightarrow \text{H}_2\text{O}(\text{g})$

Answer

9. Solution 'X' contains Na_2CO_3 and NaHCO_3 , 20 mL of X when titrated using methyl orange indicator consumed 60 mL of 0.1 M HCl solution. In another experiment, 20 mL of X solution when titrated using phenolphthalein, consumed 20 mL of 0.1 M HCl solution. The concentrations (in mol L^{-1}) of Na_2CO_3 and NaHCO_3 in X are respectively

- A. 0.01, 0.02

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C. 0.01, 0.01

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Answer

10. A compound absorbs light in the wavelength region 490-500 nm. Its complementary colour is
- red
 - blue
 - orange
 - blue-green

Answer

11. The pK_a values of four carboxylic acids are given below. Identify the weakest carboxylic acid.
- 4.89
 - 1.28
 - 4.76
 - 2.56

Answer

12. Which one of the following is an example of disproportionation reaction?
- $3Cl_2(g) + 6OH^-(aq) \rightarrow ClO_3^-(aq) + 5Cl^-(aq) + 3H_2O(l)$
 - $Ag^{2+}(aq) + Ag(s) \rightarrow 2Ag^+(aq)$
 - $Zn(s) + CuSO_4(aq) \rightarrow Cu(s) + ZnSO_4(aq)$
 - $2KClO_3(s) \rightarrow 2KCl(s) + 3O_2(g)$

Answer

13. Observe the following statements-
- Heavy water is harmful for the growth of animals.
 - Heavy water reacts with Al_4C_3 and forms deuterated acetylene.
 - $BaCl_2 \cdot 2D_2O$ is an example of interstitial deuterate.

The correct statements are-

- 1 and 3
- 1 and 2
- 1, 2 and 3
- 2 and 3

Answer

14. Diborane reacts with HCl in the presence of $AlCl_3$ and liberates
- H_2
 - Cl_2
 - BCl_3

D. Cl_2 and BCl_3 Like. Share. Bookmark. Download. Make Notes. Print - Your Favourite Questions. Join www.zigya.com

15. How many corners of SiO_4 units are shared in the formation of three dimensional silicates?

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- A. 3
B. 2
C. 4
D. 1

Answer

16. $\text{Na}_2\text{S}_2\text{O}_3$ reacts with moist Cl_2 to form Na_2SO_4 , HCl and X. Which one of the following is X?

- A. H_2S
B. SO_2
C. SO_3
D. S

Answer

17. Cataract and skin cancer are caused by

- A. depletion of nitric oxide
B. depletion of ozone layer
C. increase in methane
D. depletion of nitrous oxide

Answer

18. $\text{C}_2\text{H}_6 \xrightarrow{450^\circ\text{C}} \text{C}_2\text{H}_4 + \text{H}_2$

Above reaction is known as

- A. combustion
B. rearrangement
C. pyrolysis
D. cleavage

Answer

19. Assertion (A) : NH_2 group of aniline is *ortho*, *para* directing in electrophilic substitutions.

Reason (R) : $-\text{NH}_2$ group stabilises the arenium ion formed by the *ortho*, *para* attack of the electrophile.

The correct answer is

- A. Both (A) and (R) are correct, (R) is the correct explanation of (A).
B. Both (A) and (R) are correct, (R) is not the correct explanation of (A).
C. (A) is correct, but (R) is not correct.
D. (A) is not correct, but (R) is correct.

Answer

20. In which of the following properties, the two enantiomers of lactic acid differ from each other?

- A. Sign of specific rotation

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D. Refractive index

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Answer

21. Heating chloroform with aqueous sodium hydroxide solution forms-

- A. sodium acetate
- B. sodium oxalate
- C. sodium formate
- D. chloral

Answer

22. At T (K), the ratio of kinetic energies of 4g of H₂ (g) and 8 g of O₂ (g) is

- A. 1 : 4
- B. 4 : 1
- C. 2 : 1
- D. 8 : 1

Answer

23. Which one of the following is an isotonic pair of solutions?

- A. 0.15 M NaCl and 0.11 M Na₂SO₄
- B. 0.2 M Urea and 0.1 M Sugar
- C. 0.1 M BaCl₂ and 0.2 M Urea
- D. 0.4 M MgSO₄ and 0.1 M NH₄Cl

Answer

24. The vapour pressure in mm of Hg, of an aqueous solution obtained by adding 18 g of glucose (C₆H₁₂O₆) to 180g of water at 100°C is

- A. 76.0
- B. 7.60
- C. 759
- D. 752.4

Answer

25. During the electrolysis of copper sulphate aqueous solution using copper electrode, the reaction taking place at the cathode is

- A. $\text{Cu} \rightarrow \text{Cu}^{2+} (\text{aq}) + 2\text{e}^-$
- B. $\text{Cu}^{2+} (\text{aq}) + 2\text{e}^- \rightarrow \text{Cu} (\text{s})$
- C. $\text{H}^+ (\text{aq}) + \text{e}^- \rightarrow \frac{1}{2} \text{H}_2 (\text{g})$
- D. $\text{SO}_4^{2-} (\text{aq}) \rightarrow \text{SO}_3 (\text{g}) + \frac{1}{2} \text{O}_2 (\text{g}) + 2\text{e}^-$

Answer

26. The extent of charge of lead accumulator is determined by

- A. amount of PbSO₄ in the battery

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D. amount of Pb in the battery

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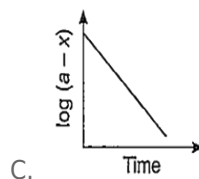
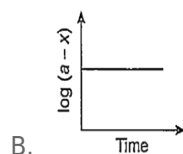
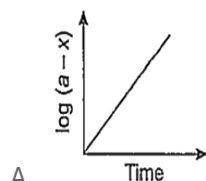
Answer

27. The number of octahedral and tetrahedral holes respectively present in a hexagonal close packed (hcp) crystal of 'X' atoms are

- A. X, 2X
- B. X, X
- C. 2X, X
- D. 2X, 2X

Answer

28. Which one of the following plots is correct for a first order reaction?



Answer

29. Match the following:

List - I	List - II
A. Solid dispersed in liquid	i. Emulsion
B. Liquid dispersed in liquid	ii. Foam
C. Gas dispersed in liquid	iii. Gel
D. Liquid dispersed in solid	iv. Sol v. Aerosol

The correct match is

- A. A - iv; B - i; C - ii; D - iii

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A - ii; B - i; C - v; D - ii

C - A - iii; B - i; C - ii; D - iv

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D - A - iv; B - i; C - v; D - iii

Answer

30. Which one of the following is not correct?

- A. Pyrophosphoric acid is a tetrabasic acid.
- B. Pyrophosphoric acid contains P-O-P linkage. Pyrophosphoric acid contains two P-H bonds.
- C. Pyrophosphoric acid contains two P-H bonds.
- D. Orthophosphoric acid can be prepared by dissolving P_4O_{10} in water.

Answer

31. The role of copper diaphragm in Whytlaw-Gray's method is

- A. preventing the corrosion of electrolytic cell
- B. preventing the mixing of H_2 and F_2
- C. as anode
- D. as cathode

Answer

32. Liquid X is used in bubble chamber to detect neutral mesons and gamma photons. Then, X is

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

Answer

33. Which of the following is not added during the extraction of silver by cyanide process?

- A. NaCN
- B. Air
- C. Zn
- D. $Na_2S_2O_3$

Answer

34. Which one of the following gives Prussian blue colour?

- A. $Fe_2[Fe(CN)_6]$
- B. $Na_4[Fe(CN)_6]$
- C. $Fe_3[Fe(CN)_6]_3$
- D. $Fe_4[Fe(CN)_6]_3$

Answer

35. The products formed, in the reaction of phenol with Br_2 dissolved in CS_2 at $0^\circ C$ are

- A. *o*-bromo, *m*-bromo and *p*-bromophenols
- B. *o*-bromo and *p*-bromophenols

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Answer

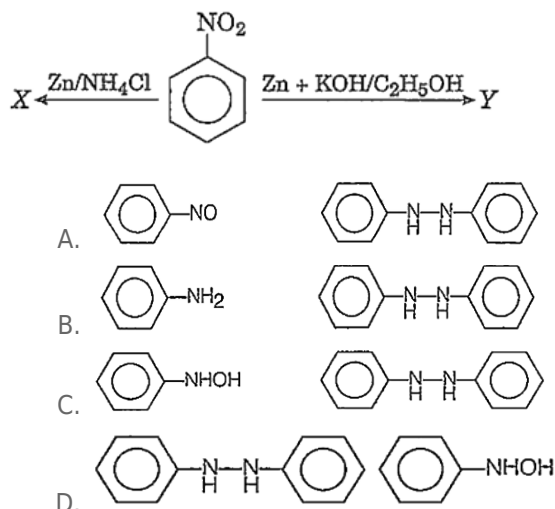
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36. The structure of PCC is

- A. $C_6H_5N^+HCrO_2Cl^-$
- B. $C_6H_5N^+HCrO_2Cl^-$
- C. $C_5H_5N^+HCrO_2Cl^-$
- D. $C_5H_5N^+HCrO_3Cl^-$

Answer

37. Identify X and Y in the following reactions-



Answer

38. Example of a biodegradable polymer pair is

- A. nylon-6, 6 and terylene
- B. PHBV and dextran
- C. bakelite and PVC
- D. PET and polyethylene

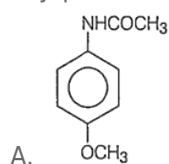
Answer

39. The number of hydrogen bonds between guanine and cytosine and between adenine and thymine in DNA is

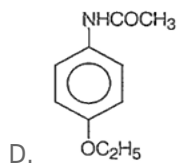
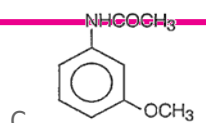
- A. 1, 2
- B. 3, 2
- C. 3, 1
- D. 2, 1

Answer

40. Identify phenacetin from the following-



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Answer