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Previous Year Paper

Chemistry - 2012

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Multiple Choice Questions

1. The quantum number which explains the line spectra observed as doublets in case of hydrogen and alkali metals and doublets and triplets in case of alkaline earth metals is
- spin
 - azimuthal
 - magnetic
 - principal

Answer

2. The formal charges of C and O atoms in CO_2 ($:\ddot{\text{O}}=\text{C}::\ddot{\text{O}}$) are respectively
- 1, -1
 - 1, 1
 - 2, -2
 - 0, 0

Answer

3. According to molecular orbital theory, the total number of bonding electron pairs in O_2 is
- 2
 - 3
 - 5
 - 4

Answer

4. Which one of the following equations represents the variation of viscosity coefficient (η) with temperature (T)?
- $\eta = Ae^{-E/RT}$
 - $\eta = Ae^{E/RT}$
 - $\eta = Ae^{-E/kT}$
 - $\eta = Ae^{-E/T}$

Answer

5. The number of moles of electrons required to deposit 36 g of Al from an aqueous solution of $\text{Al}(\text{NO}_3)_3$ is (At. wt. of Al = 27)
- 4
 - 3
 - 2
 - 1

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6. Which one of the following statements is not correct?

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A. The pH of 1.0×10^{-8} M HCl is less than 7.

B. The ionic product of water at 25°C is $1.0 \times 10^{-14} \text{ mol}^2\text{L}^{-2}$

C. Cl^- is a Lewis acid

D. Bronsted Lowry theory cannot explain the acidic character of AlCl_3 .

Answer

7. Molar heat capacity (C_p) of water at constant pressure is $75 \text{ JK}^{-1}\text{mol}^{-1}$. The increase in temperature (in K) of 100 g of water when 1 kJ of heat is supplied to it is

A. 2.4

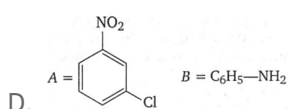
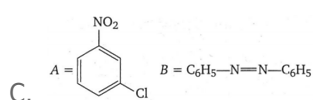
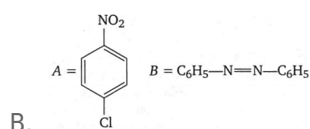
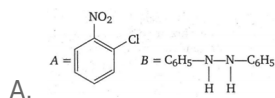
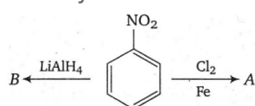
B. 0.24

C. 1.3

D. 0.13

Answer

8. Identify A and B in the following reactions



Answer

9. With respect to chlorobenzene, which of the following statements is not correct ?

A. Cl is *ortho/para* directing

B. Cl exhibits + M effect

C. Cl is ring deactivating

D. Cl is meta directing

Answer

10. Match the following.

	Column I		Column II
A.	Acetaldehyde, vinyl alcohol	1.	Enantiomers

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Chemistry			Exam Year	
JEE 2012			2012	
B.	gauche and staggered ethane	2.	Tautomers	Study, Assignments, Solved Previous Year Papers . Questions and Answers. Free Forever.
C.	(+)-2-butanol, (-)-2-butanol	3.	Chain isomers	
D.	Methyl-n-propyl-amine and diethylamine	4.	Conformational isomers	
		5.	Metamers	

A. A B C D

1 4 3 5

B. A B C D

2 4 1 5

C. A B C D

5 1 4 2

D. A B C D

5 1 3 2

Answer

11. Which of the following statements is not correct?

A. The six carbons in benzene are sp^2 hybridised.

B. Benzene has $(4n + 2)$ π electrons.

C. Benzene undergoes substitution reactions

D. Benzene has two carbon-carbon bond lengths, 1.54 Å and 1.34 Å.

Answer

12. Different conformations of the same molecule are called

A. isomers

B. epimers

C. enantiomers

D. rotamers

Answer

13. The chlorination of ethane is an example for which type of the following reactions ?

A. Nucleophilic substitution

B. Electrophilic substitution

C. Free radical substitution

D. Rearrangement

Answer

14. The pair of gases responsible for acid rain are

A. H_2 , O_3

B. CH_4 , O_3

C. NO_2 , SO_2

D. CO, CH_4

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15. In photoelectric effect, if the energy required to overcome the attractive forces on the electron, (work functions) of Li, Na and Rb are 2.41 eV, 2.30 eV and 2.09 eV respectively, the work function of 'K' could approximately be in eV.

- A. 2.52
- B. 2.20
- C. 2.35
- D. 2.01

Answer

16. One mole of N_2H_4 loses 10 moles of electrons to form a new compound Z. Assuming that all the nitrogens appear in the new compound, what is the oxidation state of nitrogen in Z? (There is no change in the oxidation state of hydrogen.)

- A. -1
- B. -3
- C. +3
- D. +5

Answer

17. Ni anode is used in the electrolytic extraction of

- A. Al
- B. Mg
- C. Na by Down's process
- D. Na by Castner's process

Answer

18. Which of the following is not correct?

- A. LiOH is a weaker base than NaOH.
- B. Salts of Be undergo hydrolysis
- C. $Ca(HCO_3)_2$ is soluble in water.
- D. Hydrolysis of beryllium carbide gives acetylene.

Answer

19. What is Z in the following reactions ?



- A. $(CH_3)BH_2$
- B. $(CH_3)_4B_2H_2$
- C. $(CH_3)_3B_2H_3$
- D. $(CH_3)_6B_2$

Answer

20. Which one of the following elements reduces NaOH to Na?

- A. Si

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C. C

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Answer

21. Which one of the following cannot form an amphoteric oxides?

- A. Al
- B. Sn
- C. Sb
- D. P

Answer

22. The weight in grams of a non-volatile solute (mol. wt. 60) to be dissolved in 90 g of water to produce a relative lowering of vapour pressure of 0.02 is

- A. 4
- B. 8
- C. 6
- D. 10

Answer

23. The experimentally determined molar mass of a non-volatile solute, BaCl_2 in water by Cottrell's method, is

- A. equal to the calculated molar mass
- B. more than the calculated molar mass
- C. less than the calculated molar mass
- D. double of the calculated molar mass

Answer

24. The emf (in V) of a Daniell cell containing 0.1 M ZnSO_4 and 0.01 M CuSO_4 solutions at their respective electrodes is $(E_{\text{Cu}^{2+}/\text{Cu}^\circ} = + 0.34 \text{ V}; E_{\text{Zn}^{2+}/\text{Zn}^\circ} = -0.76 \text{ V})$

- A. 1.10
- B. 1.16
- C. 1.13
- D. 1.07

Answer

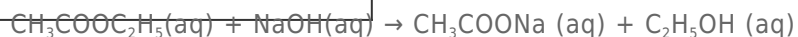
25. Which one of the following elements, when present as an impurity in silicon makes it a p-type semiconductor?

- A. As
- B. P
- C. In
- D. Sb

Answer

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26. Which one of the following statements is correct for the reaction?



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- A. Order is two but molecularity is one
- B. Order is one but molecularity is two
- C. Order is one but molecularity is one
- D. Order is two but molecularity is two

Answer

27. The catalyst and promoter respectively used in the Haber's process of industrial synthesis of ammonia are

- A. $\text{Mo}, \text{V}_2\text{O}_5$
- B. $\text{V}_2\text{O}_5, \text{Fe}$
- C. Fe, Mo
- D. Mo, Fe

Answer

28. Gelly is a colloidal solution of

- A. solid in liquid
- B. liquid in solid
- C. liquid in liquid
- D. solid in solid

Answer

29. Bond energy of Cl_2 , Br_2 and I_2 follow the order

- A. $\text{Cl}_2 > \text{Br}_2 > \text{I}_2$
- B. $\text{Br}_2 > \text{Cl}_2 > \text{I}_2$
- C. $\text{I}_2 > \text{Br}_2 > \text{Cl}_2$
- D. $\text{I}_2 > \text{Cl}_2 > \text{Br}_2$

Answer

30. Assertion (A): The boiling points of noble gases increases from He to Xe.

Reason (R): The interatomic van der Waals' attractive forces increases from He to Xe.

The correct answer is:

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

Answer

31. A coordinate complex contains Co^{3+} , Cl^- and NH_3 . When dissolved in water, one mole of this complex gave a total of 3 moles of ions. The complex is

- A. $[\text{Co}(\text{NH}_3)_6]\text{Cl}_3$

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C. $[\text{Co}(\text{NH}_3)_4\text{Cl}_2]\text{Cl}$

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D. $[\text{Co}(\text{NH}_3)_3\text{Cl}_3]$

Answer

32. The product(s) formed when H_2O_2 reacts with disodium hydrogen phosphate is

- A. $\text{P}_2\text{O}_5 \cdot \text{Na}_3\text{PO}_4$
- B. $\text{Na}_2\text{HPO}_4 \cdot \text{H}_2\text{O}_2$
- C. $\text{NaH}_2\text{PO}_4, \text{H}_2\text{O}$
- D. $\text{Na}_2\text{HPO}_4 \cdot \text{H}_2\text{O}$

Answer

33. Which one of the following is used in the preparation of cellulose nitrate ?

- A. KNO_3
- B. HNO_3
- C. KNO_2
- D. HNO_2

Answer

34. The oxoacid of sulphur which contains two sulphur atoms in different oxidation states is

- A. pyrosulphurous acid
- B. hyposulphurous acid
- C. pyrosulphuric acid
- D. persulphuric acid

Answer

35. Benzene 4-hydroxy acetanilide belongs to which of the following?

- A. Antipyretic
- B. Antacid
- C. Antiseptic
- D. Antihistamine

Answer

36. The site of action of insulin is

- A. mitochondria
- B. nucleus
- C. plasma membrane
- D. DNA

Answer

37. The monomer of neoprene is

- A. 1,3-butadiene
- B. 2-chloro-1,3-butadiene
- C. 2-methyl-1,3-butadiene

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Answer

38. What is the product obtained in the reaction of acetaldehyde with semicarbazide?

- A. $\text{H}_3\text{C}-\text{CH}=\text{N}-\text{NHCONH}_2$
- B. $\text{H}_3\text{C}-\text{CH}=\text{N}-\text{NH}_2$
- C. $\text{H}_3\text{C}-\text{CH}=\text{N}-\text{OH}$
- D. $\text{H}_3\text{C}-\text{C}(\text{CH}_3)=\text{N}-\text{NH}-\text{CO}-\text{NH}_2$

Answer

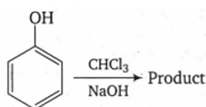
39. Compound A ($\text{C}_3\text{H}_6\text{O}$) undergoes following reactions to form B and C. Identify A, B and C.

$\text{C}-\text{Zn}-\text{Hg}/\text{HCl}$ $\text{C}_3\text{H}_6\text{O}$ $\text{A} \rightarrow \text{I}_2/\text{NaOH}$ B

- A. $\text{H}_3\text{C}-\text{CO}-\text{CH}_3$, CHI_3 , $\text{CH}_3-\text{CH}_2-\text{CH}_3$
- B. $\text{H}_2\text{C}=\text{CH}-\text{CH}_2\text{OH}$, CH_3I , $\text{H}_3\text{C}-\text{CH}_2-\text{CH}_2-\text{OHC}$
- C. $\text{H}_3\text{C}-\text{CH}_2-\text{CHO}$, CHI_3 , $\text{H}_3\text{C}-\text{CHOH}-\text{CH}_3$
- D. $\text{H}_3\text{C}-\text{CO}-\text{CH}_3$, CHI_3 , $\text{H}_3\text{C}-\text{CHOH}-\text{CH}_3$

Answer

40. Identify the product in the following reaction



- A.
- B.
- C.
- D.

Answer