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Previous Year Paper

Chemistry - 2019

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Multiple Choice Questions

1. A gas at 350 K and 15 bar has molar volume 20 percent smaller than that for an ideal gas under the same conditions. The correct option about the gas and its compressibility factor (Z) is :
- A. $Z > 1$ and repulsive forces are dominant
 - B. $Z < 1$ and attractive forces are dominant
 - C. $Z < 1$ and repulsive forces are dominant
 - D. $Z > 1$ and attractive forces are dominant

Answer

2. 4d, 5p, 5f and 6p orbitals are arranged in the order of decreasing energy. The correct option is:
- A. $6p > 5f > 5p > 4d$
 - B. $6p > 5f > 4d > 5p$
 - C. $5f > 6p > 4d > 5p$
 - D. $5f > 6p > 5p > 4d$

Answer

3. Which will make basic buffer?
- A. 100mL of 0.1 M CH_3COOH + 100mL of 0.1M NaOH
 - B. 100 mL of 0.1 M HCl + 200 mL of 0.1 M NH_4OH
 - C. 100 mL of 0.1 M HCl + 100 mL of 0.1 M NaOH
 - D. 50 mL of 0.1 M NaOH + 25 mL of 0.1 M CH_3COOH

Answer

4. Which of the following diatomic molecular species has only π bonds according to Molecular Orbital Theory?
- A. N_2
 - B. C_2
 - C. Be_2
 - D. O_2

Answer

5. Under isothermal condition, a gas at 300 K expands from 0.1 L to 0.25 L against a constant external pressure of 2 bar. The work done by the gas is:(Given that 1 L bar = 100 J)
- A. 5 kJ
 - B. 25 J
 - C. 30 J
 - D. -30 J

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6. Which of the following series of transitions in the spectrum of hydrogen atom fall in visible region?

A. Balmer series
B. Paschen series
C. Brackett series
D. Lyman series

Answer

7. Conjugate base for Brønsted acids H_2O and HF are :

A. H_3O^+ and F^- , respectively
B. OH^- and F^- , respectively
C. H_3O^+ and H_2F^+ , respectively
D. OH^- and H_2F^+ , respectively

Answer

8. In which case change in entropy is negative?

A. Expansion of a gas at constant temperature
B. Sublimation of solid to gas
C. $2\text{H}(\text{g}) \rightarrow \text{H}_2(\text{g})$
D. Evaporation of water

Answer

9. The manganate and permanganate ions are tetrahedral, due to :

A. There is no π -bonding
B. The π - bonding involves overlap of p-orbitals of oxygen with p-orbitals of manganese.
C. The π -bonding involves overlap of d-orbitals of oxygen with d-orbitals of manganese
D. The π -bonding involves overlap of p-orbitals of oxygen with d-orbitals of manganese

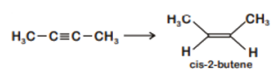
Answer

10. pH of a saturated solution of $\text{Ca}(\text{OH})_2$ is 9. The solubility product (K_{sp}) of $\text{Ca}(\text{OH})_2$ is:

A. 0.25×10^{-10}
B. 0.5×10^{-15}
C. 0.125×10^{-15}
D. 0.5×10^{-10}

Answer

11. The most suitable reagent for the following conversion, is :



A. H_2 , Pd/C, quinoline

D. Na/liquid NH_3

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[Answer](#)

12. Which of the following reactions are disproportionation reaction?

- (a) $2\text{Cu}^+ \rightarrow \text{Cu}^{2+} + \text{Cu}^0$
(b) $3\text{MnO}_4^{2-} + 4\text{H}^+ \rightarrow 2\text{MnO}_4^- + \text{MnO}_2 + 2\text{H}_2\text{O}$
(c) $2\text{KMnO}_4 \xrightarrow{\Delta} \text{K}_2\text{MnO}_4 + \text{MnO}_2 + \text{O}_2$
(d) $2\text{MnO}_4^- + 3\text{Mn}^{2+} + 2\text{H}_2\text{O} \rightarrow 5\text{MnO}_2 + 4\text{H}^+$

Select the correct option from the following

- A. (a), (b) and (c)
B. (a), (c) and (d)
C. (a) and (d) only
D. (a) and (b) only

[Answer](#)

13. For the second period elements the correct increasing order of first ionisation enthalpy is:

- A. $\text{Li} < \text{B} < \text{Be} < \text{C} < \text{O} < \text{N} < \text{F} < \text{Ne}$
B. $\text{Li} < \text{B} < \text{Be} < \text{C} < \text{N} < \text{O} < \text{F} < \text{Ne}$
C. $\text{Li} < \text{Be} < \text{B} < \text{C} < \text{O} < \text{N} < \text{F} < \text{Ne}$
D. $\text{Li} < \text{Be} < \text{B} < \text{C} < \text{N} < \text{O} < \text{F} < \text{Ne}$

[Answer](#)

14. The number of sigma (σ) and pi (π) pent-2-en-4-yne is

- A. 8σ bonds and 5π bonds
B. 11σ bonds and 2π bonds
C. 13σ bonds and no π bonds
D. 10σ bonds and 3π bonds

[Answer](#)

15. Among the following, the one that is not a green house gas is:

- A. Methane
B. Ozone
C. Sulphur dioxide
D. Nitrous oxide

[Answer](#)

16. Which of the following is an amphoteric hydroxide?

- A. $\text{Ca}(\text{OH})_2$
B. $\text{Mg}(\text{OH})_2$
C. $\text{Be}(\text{OH})_2$

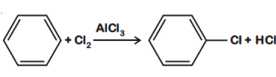
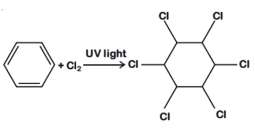
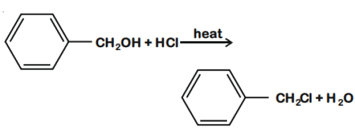
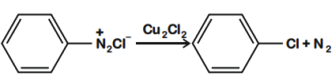
17. The method used to remove temporary hardness of water is :

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- A. Clark's method
- B. Ion-exchange method
- C. Synthetic resins method
- D. Calgon's method

Answer

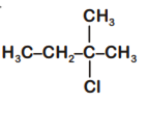
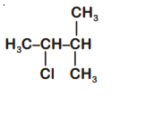
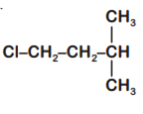
18. Among the following, the reaction that proceeds through an electrophilic substitution, is:

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

Answer

19. An alkene "A" on reaction with O_3 and $Zn-H_2O$ gives propanone and ethanal in equimolar ratio.

Addition of HCl to alkene "A" gives "B" as the major product. The structure of product "B" is:

- A. $H_3C-CH_2-CH(CH_2Cl)-CH_3$
- B. 
- C. 
- D. 

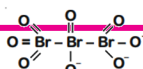
Answer

20. Enzymes that utilize ATP in phosphate transfer require an alkaline earth metal (M) as the cofactor. M is :

- A. Mg
- B. Ca
- C. Sr
- D. Be

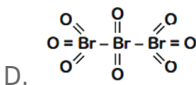
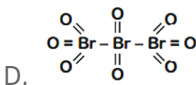
Answer

21. The correct structure of tribromooctaoxide is



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Answer

22. For a cell involving one electron $E^\circ_{\text{cell}} = 0.59 \text{ V}$ at 298 K, the equilibrium constant for the cell reaction is : [Given that $2.303F = 0.059 \text{ V}$ at $T = 298 \text{ K}$].

- A. 1.0×10^5
- B. 1.0×10^{10}
- C. 1.0×10^{30}
- D. 1.0×10^2

Answer

23. The number of moles of hydrogen molecules required to produce 20 moles of ammonia through Haber's process is :

- A. 20
- B. 30
- C. 40
- D. 10

Answer

24. Which is the correct thermal stability order for H_2E (E = O, S, Se, Te and Po)?

- A. $\text{H}_2\text{O} < \text{H}_2\text{S} < \text{H}_2\text{Se} < \text{H}_2\text{Te} < \text{H}_2\text{Po}$
- B. $\text{H}_2\text{Po} < \text{H}_2\text{Te} < \text{H}_2\text{Se} < \text{H}_2\text{S} < \text{H}_2\text{O}$
- C. $\text{H}_2\text{Se} < \text{H}_2\text{Te} < \text{H}_2\text{Po} < \text{H}_2\text{O} < \text{H}_2\text{S}$
- D. $\text{H}_2\text{S} < \text{H}_2\text{O} < \text{H}_2\text{Se} < \text{H}_2\text{Te} < \text{H}_2\text{Po}$

Answer

25. Identify the incorrect statement related to PCl_5 from the following:

- A. Two axial P-Cl bonds make an angle of 180° with each other
- B. Axial P-Cl bonds are longer than equatorial P-Cl bonds
- C. PCl_5 molecules in non-reactive
- D. Three equatorial P-Cl bonds make an angle of 120° with each other

Answer

26. Which one is malachite from the following?

- A. $\text{Cu}(\text{OH})_2$
- B. Fe_3O_4
- C. $\text{CuCO}_3, \text{Cu}(\text{OH})_2$

27. The mixture that forms maximum boiling azeotrope is:

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A. Ethanol + Water

B. Acetone + Carbon disulphide

C. Heptane + Octane

D. Water + Nitric acid

Answer

28. For an ideal solution, the correct option is :

A. $\Delta_{\text{mix}} V \neq 0$ at constant T and P

B. $\Delta_{\text{mix}} H = 0$ at constant T and P

C. $\Delta_{\text{mix}} G = 0$ at constant T and P

D. $\Delta_{\text{mix}} S = 0$ at constant T and P

Answer

29. If the rate constant for a first order reaction is k, the time (t) required for the completion of 99% of the reaction is given by:

A. $t = 6.909/k$

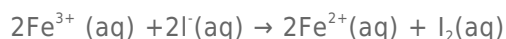
B. $t = 4.606/k$

C. $t = 2.303/k$

D. $t = 0.693/k$

Answer

30. For the cell reaction



$E_{\text{cell}}^{\ominus} = 0.24\text{V}$ at 298 K. The standard Gibbs energy ($\Delta_r G^{\ominus}$) of the cell reaction is:

[Given that Faraday constant $F = 96500 \text{ C mol}^{-1}$]

A. $-23.16 \text{ kJ mol}^{-1}$

B. $46.32 \text{ kJ mol}^{-1}$

C. $23.16 \text{ kJ mol}^{-1}$

D. $-46.32 \text{ kJ mol}^{-1}$

Answer

31. What is the correct electronic configuration of the central atom in $\text{K}_4[\text{Fe}(\text{CN})_6]$ based on crystal field theory

A. $t_2g^6 e_g^0$

B. $e_3 t_2^3$

C. $e_4 t_2^2$

D. $t_2g^4 e_g^2$

Answer

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32. A compound is formed by cation C and anion A. The anions form hexagonal close packed (hcp) lattice and the cations occupy 75% of octahedral voids. The formula of the compound is :
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A. C_3A_2 B. C_3A_4 C. C_4A_3 D. C_2A_3

Answer

33. Match the Xenon compounds in Column-I with its structure in Column-II and assign the correct code:

Column-I	Column- II
(a) XeF_4	(i) Pyramidal
(b) XeF_6	(ii) Square planar
(c) $XeOF_4$	(iii) Distorted octahedral
(d) XeO_3	(iv) Square pyramidal

Code:

A. (a) (b) (c) (d)

(ii) (iii) (iv) (i)

B. (a) (b) (c) (d)

(ii) (iv) (i) (iv)

C. (a) (b) (c) (d)

(iii) (iv) (i) (ii)

D. (a) (b) (c) (d)

(i) (ii) (iii) (iv)

Answer

34. Which of the following is incorrect statement?

A. $SiCl_4$ is easily hydrolysedB. GeX_4 (X = F, Cl, Br, I) is more stable than GeX_2 C. SnF_4 is ionic in natureD. PbF_4 is covalent in nature

Answer

35. Which mixture of the solutions will lead to the formation of negatively charged colloidal $[AgI]^-$ sol ?

A. 50 mL of 1 M $AgNO_3$ + 50 mL of 2 M KIB. 50 mL of 2 M $AgNO_3$ + 50 mL of 1.5 M KILike. Share. Bookmark. Download. Make Notes. Print - Your Favourite Questions. Join www.zigya.com

D. 50 mL of 1 M AgNO_3 + 50 mL of 1.5 M KI

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Answer

36. Match the following :

(a) Pure nitrogen	(i) Chlorine
(b) Haber process	(ii) Sulphuric acid
(c) Contact process	(iii) Ammonia
(d) Deacon's process	(iv) Sodium azide or Barium azide

Which of the following is the correct option?

- A. (a) (b) (c) (d)
(ii) (iv) (i) (iii)
- B. (a) (b) (c) (d)
(iii) (iv) (ii) (i)
- C. (a) (b) (c) (d)
(iv) (iii) (ii) (i)
- D. (a) (b) (c) (d)
(i) (ii) (iii) (iv)

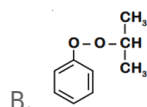
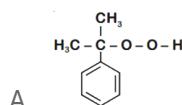
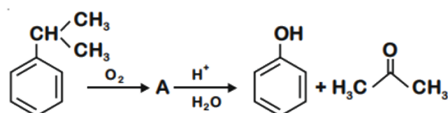
Answer

37. Which of the following species is not stable?

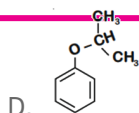
- A. $[\text{GeCl}_6]^{2-}$
- B. $[\text{Sn}(\text{OH})_6]^{2-}$
- C. $[\text{SiCl}_6]^{2-}$
- D. $[\text{SiF}_6]^{2-}$

Answer

38. The structure of intermediate A in the following reaction, is



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Answer

39. The non-essential amino acid among the following is:

- A. Leucine
- B. Alanine
- C. Lysine
- D. Valine

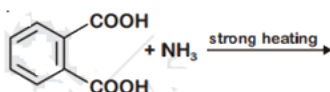
Answer

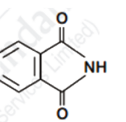
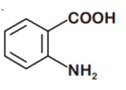
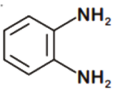
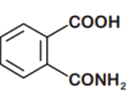
40. The biodegradable polymer is:

- A. Nylon-2-Nylon 6
- B. Nylon-6
- C. Buna-S
- D. Nylon-6,6

Answer

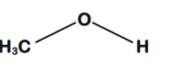
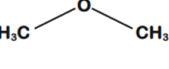
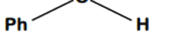
41. The major product of the following reaction is:



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

Answer

42. The compound that is most difficult to protonate is :

- A. 
- B. 
- C. 

[Answer](#) Study, Assignments, Solved Previous Year Papers . Questions and Answers. Free Forever.

43. For the chemical reaction:



The correct option is:

- A. $-\text{dN}_2/\text{dt} = 2\text{dNH}_3/\text{dt}$
- B. $-\text{dN}_2/\text{dt} = 12\text{dNH}_3/\text{dt}$
- C. $3\text{dH}_2/\text{dt} = 2\text{dNH}_3/\text{dt}$
- D. $-13\text{dH}_2/\text{dt} = -12\text{dNH}_3/\text{dt}$

[Answer](#)

44. The correct order of the basic strength of methyl substituted amines in aqueous solution is :

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

[Answer](#)

45. Among the following, the narrow spectrum antibiotic is :

- A. Ampicillin
- B. Amoxycillin
- C. Chloramphenicol
- D. Penicillin G

[Answer](#)