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Previous Year Paper

Chemistry - 2011



Multiple Choice Questions

1. The pH of an aqueous solution of CH_3COONa of concentration $C(\text{M})$ is given by

- A. $7 - 12\text{pK}_a - 12\log C$
- B. $12\text{pK}_w + 12\text{pK}_b + 12\log C$
- C. $12\text{pK}_w - 12\text{pK}_b - 12\log C$
- D. $12\text{pK}_w + 12\text{pK}_a + 12\log C$

Answer

2. If the equilibrium constants of the following equilibria,



are given by K_1 and K_2 respectively, which of the following relation is correct?

- A. $K_2 = 1K_1^2$
- B. $K_1 = 1K_2^3$
- C. $K_2 = 1K_1$
- D. $K_2 = (K_1)^2$

Answer

3. The energy of an electron in first Bohr orbit of H-atom is -13.6 eV. The possible energy value of electron in the excited state of Li^{2+} is

- A. -122.4 eV
- B. 30.6 eV
- C. -30.6 eV
- D. 13.6 eV

Answer

4. The amount of the heat released when 20 mL 0.5 M NaOH is mixed with 100 mL 0.1 M HCl is x kJ. The heat of neutralisation is

- A. $-100 \times \text{kJ/mol}$
- B. $-50 \times \text{kJ/mol}$
- C. $+100 \times \text{kJ/mol}$
- D. $+50 \times \text{kJ/mol}$

Answer

5. Which one of the following has the lowest ionisation energy?

- A. $1s^2, 2s^2, 2p^6$

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D. $1s^2, 2s^2, 2p^3$

Answer

6. 2 g of metal carbonate is neutralised completely by 100 mL of 0.1 N HCl. The equivalent weight of metal carbonate is
- 50
 - 100
 - 150
 - 200

Answer

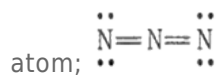
7. The representation of the ground state electronic configuration of He by box-diagram as $\boxed{\uparrow\uparrow}$ is wrong because it violates
- Heisenberg's uncertainty principle
 - Bohr's quantization theory of angular momenta
 - Pauli exclusion principle
 - Hund's rule

Answer

8. The electronic transitions from $n = 2$ to $n = 1$ will produce shortest wavelength in (where $n =$ principal quantum state)
- Li^{2+}
 - He^+
 - H
 - H^+

Answer

9. In the following electron-dot structure, calculate the formal charge from left to right nitrogen



- 1, -1, +1
- 1, +1, -1
- +1, -1, -1
- +1, -1, +1

Answer

10. If the molecular wt. of Na_2SO_3 and I_2 are M_1 and M_2 respectively then what will be the equivalent weight of Na_2SO_3 and I_2 in the following reaction?



C. $2M_1, M_2$

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D. $M_1, 2M_2$

Answer

11. A radioactive atom YXM emits two α particles and one β particle successively. The number of neutrons in the nucleus of the product will be
- A. $X - 4 - Y$
B. $X - Y - 5$
C. $X - Y - 3$
D. $X - Y - 6$

Answer

12. Which one of the following is paramagnetic?
- A. N_2
B. NO
C. CO
D. O_3

Answer

13. The sp^3d^2 hybridisation of central atom of a molecule would lead to
- A. square planar geometry
B. tetrahedral geometry
C. trigonal bipyramidal geometry
D. octahedral geometry

Answer

14. Which of the following is used to prepare Cl_2 gas at room temperature from concentrated HCl?
- A. MnO_2
B. H_2S
C. $KMnO_4$
D. Cr_2O_3

Answer

15. The normality of 30 volume H_2O_2 is
- A. 2.678 N
B. 5.336 N
C. 8.034 N
D. 6.685 N

Answer

16. A plot of $\ln K$ against $1/T$ (abscissa) is expected to be a straight line with intercept on ordinate axis equal to

A. $\Delta S^\circ/2.303 R$ Like. Share. Bookmark. Download. Make Notes. Print - Your Favourite Questions. Join www.zigya.com

C. $-\Delta S^\circ R$

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Answer

17. The solubility of $\text{Ca}_3(\text{PO}_4)_2$ in water is y mol/L. Its solubility product is

- A. $6y^4$
- B. $36y^4$
- C. $64y^5$
- D. $108y^5$

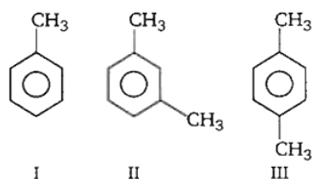
Answer

18. Hybridisation of C_2 and C_3 of $\text{H}_3\text{C}-\text{CH}=\text{C}-\text{CH}_3$ are

- A. sp , sp^3
- B. sp^2 , sp
- C. sp^2 , sp^2
- D. sp , sp

Answer

19. The ease of nitration of the following three hydrocarbons follows the order



- A. $\text{II} - \text{III} \approx \text{I}$
- B. $\text{II} > \text{III} > \text{I}$
- C. $\text{III} > \text{II} > \text{I}$
- D. $\text{I} = \text{III} > \text{II}$

Answer

20. Among the alkenes which one produces tertiary butyl alcohol on acid hydration?

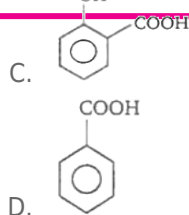
- A. $\text{CH}_3-\text{CH}_2-\text{CH}=\text{CH}_2$
- B. $\text{CH}_3-\text{CH}=\text{CH}-\text{CH}_3$
- C. $(\text{CH}_3)_2\text{C}=\text{CH}_2$
- D. $\text{CH}_3-\text{CH}=\text{CH}_2$

Answer

21. Which of the following compounds has maximum volatility?

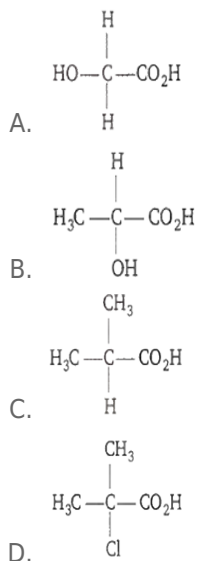
A. COOH

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Answer

22. Which one of the following will show optical isomerism?



Answer

23. The ozone layer forms naturally by

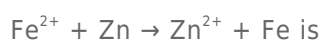
- A. the interaction of CFC with oxygen
- B. the interaction of UV radiation with oxygen
- C. the interaction of IR radiation with oxygen
- D. the interaction of oxygen and water vapour

Answer

24. The standard reduction potential E° for half-reaction are



The EMF of the cell reaction



- A. -0.35 V
- B. +0.35 V
- C. +1.17 V
- D. -1.17 V

Answer

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A. P_4O_{10} is white solidB. SO_2 is a colourless gasC. SO_3 is a colourless gasD. NO_2 is a brown gas

Answer

26. An element belongs to group 15 and third period of the Periodic Table. Its electronic configuration will be

A. $1s^2 2s^2 2p^3$ B. $1s^2 2s^2 2p^4$ C. $1s^2 2s^2 2p^6 3s^2 3p^3$ D. $1s^2 2s^2 2p^6 3s^2 3p^2$

Answer

27. Platinum, palladium and iridium are called noble metals because

A. Alfred Nobel discovered them

B. they are shining lustrous and pleasing to look at

C. they are found in native state

D. they are inert towards many common reagents

Answer

28. NO_2 is not obtained on heating

A. $AgNO_3$ B. KNO_3 C. $Cu(NO_3)_2$ D. $Pb(NO_3)_2$

Answer

29. Which of the following represents the composition of camallite mineral?

A. $K_2O \cdot Al_2O_3 \cdot 6SiO_2$ B. KNO_3 C. $K_2SO_4 \cdot MgSO_4 \cdot MgCl_2 \cdot 6H_2O$ D. $KCl \cdot MgCl_2 \cdot 6H_2O$

Answer

30. Anhydrous ferric chloride is prepared by

A. dissolving $Fe(OH)_3$ in concentrated HClB. dissolving $Fe(OH)_3$ in dilute HCl

C. passing dry HCl over heated iron scrap

D. passing dry Cl_2 gas over heated iron scrap

Answer

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test (violet colouration) are

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- A. *o*-cresol and benzyl alcohol
- B. *m*-cresol and *p*-cresol
- C. *o*-cresol and *p*-cresol
- D. methyl phenyl ether and benzyl alcohol

Answer

32. The ease of dehydrohalogenation of alkyl halide with alcoholic KOH is

- A. $3^\circ < 2^\circ < 1^\circ$
- B. $3^\circ > 2^\circ > 1^\circ$
- C. $3^\circ < 2^\circ > 1^\circ$
- D. $3^\circ > 2^\circ < 1^\circ$

Answer

33. The correct order of decreasing acidity of nitrophenols will be

- A. *m*-nitrophenol > *p*-nitrophenol > *o*-nitrophenol
- B. *o*-nitrophenol > *m*-nitrophenol > *p*-nitrophenol
- C. *p*-nitrophenol > *m*-nitrophenol > *o*-nitrophenol
- D. *p*-nitrophenol > *o*-nitrophenol > *m*-nitrophenol

Answer

34. An electric current is passed through an aqueous solution of a mixture of alanine (isoelectric point 6.0), glutamic acid (3.2) and arginine (10.7) buffered at pH 6. What is the fate of the three acids?

- A. Glutamic acid migrates to anode at pH 6. Arginine is present as a cation and migrates to the cathode. Alanine in a dipolar ion remains uniformly distributed in solution
- B. Glutamic acid migrates to cathode and others remain uniformly distributed in solution.
- C. All three remain uniformly distributed in solution.
- D. All three move to cathode

Answer

35. Which one is not a constituent of nucleic acid?

- A. Uracil
- B. Guanidine
- C. Phosphoric acid
- D. Ribose sugar

Answer

36. In aqueous solution glucose remains as

- A. only in open chain form
- B. only in pyranose form
- C. only in furanose form

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Answer

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37. Reaction of formaldehyde and ammonia gives

- A. hexamethylene tetramine
- B. bakelite
- C. urea
- D. triethylene tetramine

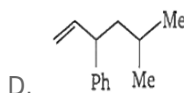
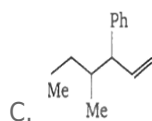
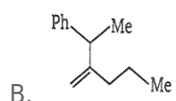
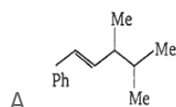
Answer

38. Paracetamol is

- A. methyl salicylate
- B. phenyl salicylate
- C. N-acetyl p-amino phenol
- D. acetyl salicylic acid

Answer

39. Which one of the following is s-butyl phenyl vinyl methane?



Answer

40. Which of the following compounds is not formed in iodoform reaction of acetone?

- A. $\text{CH}_3\text{COCH}_2\text{I}$
- B. $\text{ICH}_2\text{COCH}_2\text{I}$
- C. $\text{CH}_3\text{COCHI}_2$
- D. CH_3COCl_3

Answer



Short Answer Type

41. In 'x' mL 0.3 N HCl, addition of 200 mL distilled water or addition of 100 mL 0.1 N NaOH, gives same final acid strength. Determine 'x'.

Answer

42. Deep blue $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ is converted to a bluish white salt at 100°C . At 250°C and 750°C it is then transformed to a white powder and black material respectively. Identify the salts.

43. Compound A treated with NaNH_2 followed by $\text{CH}_3\text{CH}_2\text{Br}$ gave compound B. Partial hydrogenation of compound B produced compound C, which on ozonolysis gave a carbonyl compound D, ($\text{C}_3\text{H}_6\text{O}$). Compound D did not respond to iodoform test with I_2/KI and NaOH . Find out the structures of A, B, C and D.

Answer

44. An organic compound with molecular formula $\text{C}_9\text{H}_{10}\text{O}$ forms 2, 4-DNP derivative, reduces Tollen's reagent and undergoes Cannizzaro reaction. On vigorous oxidation it gives a dicarboxylic acid which is used in the preparation of terylene. Identify the organic compound.

Answer

45. The bacterial growth follows the rate law, $\frac{dN}{dt} = kN$ where k is a constant and 'N' is the number of bacteria cell at any time. If the population of bacteria (number of cell) is doubled in 5 min find the time in which the population will be eight times of the initial one?

Answer