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Previous Year Paper

Chemistry - 2015



Multiple Choice Questions

1. For which among the following reactions, change in entropy is less than zero?

- A. Sublimation of iodine
- B. Dissociation of hydrogen
- C. Formation of water
- D. Thermal decomposition of calcium carbonate

Answer

2. Select a ferromagnetic material from the following.

- A. Dioxygen
- B. Chromium (IV) oxide
- C. Benzene
- D. Dihydrogen monoxide

Answer

3. What is the volume of water consumed during acid hydrolysis of 1.368 kg of sucrose?

(Given : molar masses of sucrose = 342, water = 18, density of water = 1g/cm^3)

- A. 0.072 dm^3
- B. 0.070 dm^3
- C. 0.18 dm^3
- D. 0.018 dm^3

Answer

4. Identify a metalloid from the following list of elements.

- A. Carbon
- B. Neon
- C. Sodium
- D. Tellurium

Answer

5. Which among the following is a feature of adiabatic expansion?

- A. $\Delta V < 0$
- B. $\Delta U < 0$
- C. $\Delta U > 0$
- D. $\Delta T = 0$

Answer

- A. the number of moles of solute dissolved in 1 dm^3 of the solution
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B. the number of moles of solute dissolved in 1 kg of solvent

- C. the number of moles of solute dissolved in 1 dm^3 of the solvent
D. the number of moles of solute dissolved in 100 ml of the solvent

Answer

7. What is the amount of work done when two moles of ideal gas is compressed from a volume of 1 m^3 to 10 dm^3 at 300 K against a pressure of 100 kPa ?
- A. 99 kJ
B. -99 kJ
C. 114.9 kJ
D. -114.9 kJ

Answer

8. Which of the following compounds is most acidic in nature?
- A. 4-chlorobutanoic acid
B. 3-chlorobutanoic acid
C. 2-chlorobutanoic acid
D. Butanoic acid

Answer

9. $[\text{Cr}(\text{NH}_3)_6][\text{Cr}(\text{SCN})_6]$ and $[\text{Cr}(\text{NH}_3)_2(\text{SCN})_4]$ $[\text{Cr}(\text{NH}_3)_4(\text{SCN})_2]$ are the examples of what type of isomerism?
- A. Ionisation isomerism
B. Linkage isomerism
C. Coordination isomerism
D. Solvate isomerism

Answer

10. Which among the following functional groups has been given the highest priority while assigning R-S configuration?
- A. $-\text{C}_6\text{H}_5$
B. $-\text{CN}$
C. $-\text{C}_2\text{H}_5$
D. $-\text{CH}_3$

Answer

11. Given: $R = 8.314 \text{ J K}^{-1} \text{ mol}^{-1}$, the work done during combustion of 0.090 kg of ethane (molar mass = 30) at 300 K is
- A. -18.7 kJ
B. 18.7 kJ

- C. 6.234 kJ

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Answer

12. Potassium dichromate is a good oxidising agent. In acidic medium, the oxidation state of chromium changes by
- A. 2
 - B. 3
 - C. 4
 - D. 5

Answer

13. What is the possible number of monohydroxy derivatives of a hydrocarbon consisting of five carbon atoms with one methyl group as a branch?
- A. 2
 - B. 3
 - C. 4
 - D. 5

Answer

14. Chlorination of ethane is carried out in the presence of
- A. anhydrous AlBr_3
 - B. mercuric chloride
 - C. ultraviolet light
 - D. zinc chloride

Answer

15. Electronic configuration of only one p-block element is exceptional. One molecule of that element consists of how many atoms of it?
- A. One
 - B. Two
 - C. Three
 - D. Four

Answer

16. If M, W and V represent molar mass of solute, then mass of solute and volume of solution in litres respectively, which among following equations is true?
- A. $\pi = MWRTV$
 - B. $\pi = TMRWV$
 - C. $\pi = TWRVM$
 - D. $\pi = TRVWM$

Answer

17. For the reaction $\text{O}_3(\text{g}) + \text{O}(\text{g}) \rightarrow 2\text{O}_2(\text{g})$, if the rate law expression is, $\text{rate} = k [\text{O}_3][\text{O}]$, the molecularity and order of the reaction respectively are
- A. 2 and 2

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C. 2 and 1

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D. 1 and 2

Answer

18. The process in which metal surface is made inactive is called

- A. passivation
- B. galvanising
- C. corrosion
- D. pickling

Answer

19. Which among the following group 15 element forms most stable pentavalent compound?

- A. Phosphorus
- B. Antimony
- C. Bismuth
- D. Arsenic

Answer

20. What is the most abundant element on earth?

- A. Hydrogen
- B. Nitrogen
- C. Oxygen
- D. Silicon

Answer

21. The overall reaction taking place at anode during electrolysis of fused sodium chloride using suitable electrode is

- A. oxidation of chloride
- B. reduction of sodium ions
- C. reduction of chlorine
- D. oxidation of sodium atoms

Answer

22. The only radioactive element among the lanthanoids is

- A. gadolinium
- B. holmium
- C. promethium
- D. neodymium

Answer

23. What is the basicity of orthophosphorous acid?

- A. One
- B. Two
- C. Three
- D. Four

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24. Which of the following compounds has highest boiling point?

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A. Propan-1-ol

B. n-butane

C. Chloroethane

D. Propanal

Answer

25. Which oxoacid of sulphur contains S-S bond in its structure?

A. Disulphurous acid

B. Disulphuric acid

C. Perdisulphuric acid

D. Hydrosulphurous acid

Answer

26. Which among the following alloys is used in making instruments for electrical measurements?

A. Stainless steel

B. Manganin

C. Spiegeleisen

D. Duralumin

Answer

27. Which among the following solutions is not used in determination of the cell constant?

A. 10^{-2} M KCl

B. 10^{-1} M KCl

C. 1 M KCl

D. Saturated KCl

Answer

28. Which halogen forms an oxyacid that contains the halogen atom in tripositive oxidation state?

A. Fluorine

B. Chlorine

C. Bromine

D. Iodine

Answer

29. Name the metal that is purified by placing the impure metal on sloping hearth of a reverberatory furnace and heating that above its melting point in the absence of air.

A. Mercury

B. Gallium

C. Zirconium

D. Copper

Answer

30. Identify a 'chemical twin' among the following.

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B. Nb-Tc

C. Hf-Re

D. Nb-Ta

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Answer

31. The relationship between rate constant and half-life period of zero order reaction is given by

- A. $t_{1/2} = [A_0] / 2k$
- B. $t_{1/2} = 0.693/k$
- C. $t_{1/2} = [A_0] / k$
- D. $t_{1/2} = 2 [A_0] / k$

Answer

32. van't Hoff factor of centimolal solution of $K_3[Fe(CN)_6]$ is 3.333. Calculate the per cent dissociation of $K_3[Fe(CN)_6]$.

- A. 33.33
- B. 0.78
- C. 78
- D. 23.33

Answer

33. How is ore of aluminium concentrated?

- A. Roasting
- B. Leaching
- C. Froth floatation
- D. Using Wilfley table

Answer

34. Which metal among the following has the highest packing efficiency?

- A. Iron
- B. Tungsten
- C. Aluminium
- D. Polonium

Answer

35. Half-life period of a first order reaction, $A \rightarrow \text{product}$ is 6.93 h. What is the value of rate constant?

- A. 1.596 h^{-1}
- B. 0.1 h^{-1}
- C. 4.802 h^{-1}
- D. 10 h^{-1}

Answer

36. Which of the following is the most stable diazonium salt?

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B. $\text{CH}_3\text{N}_2+\text{X}^-$

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C. $\text{CH}_3\text{CH}_2\text{N}_2+\text{X}^-$

D. $\text{C}_6\text{H}_5\text{N}_2+\text{X}^-$

Answer

37. The correct IUPAC name of $[\text{Co}(\text{NH}_3)_3(\text{NO}_2)_3]$ is

- A. Triammine trinitro-N cobalt (III)
- B. Triammine trinitro-N cobalt (II)
- C. Triammine cobalt (III) nitrite
- D. Triammine trinitro-N cobaltate (III)

Answer

38. The replacement of diazonium group by fluorine is known as

- A. Gattermann reaction
- B. Sandmeyer reaction
- C. Balz-Schiemann reaction
- D. Etard reaction

Answer

39. $\text{R}-\text{C}\equiv\text{N} + 2\text{H} \rightarrow$ (ii) H_3O^+ (i) $\text{SnCl}_2/\text{dil. HCl}$ $\text{RCHO} + \text{NH}_4\text{Cl}$, this reaction is known as

- A. Etard reaction
- B. Stephen reaction
- C. Hell-Volhard-Zelinsky reaction
- D. Balz-Schiemann reaction

Answer

40. Diethyl amine when treated with nitrous acid yields

- A. diethyl ammonium nitrite
- B. ethyl alcohol
- C. N-nitroso diethyl amine
- D. triethyl ammonium nitrite

Answer

41. A mixture of benzaldehyde and formaldehyde when treated with 50% NaOH yields

- A. sodium benzoate and sodium formate
- B. sodium formate and benzyl alcohol
- C. sodium benzoate and methyl alcohol
- D. benzyl alcohol and methyl alcohol

Answer

42. Reaction of which among the following ethers with HI in cold leads to the formation of methyl alcohol?

A. Ethyl methyl ether

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C. Isopropyl methyl ether

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D. tert-butyl methyl ether

Answer

43. During conversion of glucose into glucose cyanohydrin, which functional group/atom of glucose is replaced?
- Hydrogen
 - Aldehydic group
 - Primary alcoholic group
 - Secondary alcoholic, group

Answer

44. What is the chemical composition of Nicol prism?
- Al_2O_3
 - CaSO_4
 - CaCO_3
 - Na_3AlF_6

Answer

45. Identify the heteropolymer from the list given below.
- Polythene
 - Nylon-6
 - Teflon
 - Nylon-6 6

Answer

46. The correct order of reactivity of aldehydes and ketones towards hydrogen cyanide is
- $\text{CH}_3\text{COCH}_3 > \text{CH}_3\text{CHO} > \text{HCHO}$
 - $\text{CH}_3\text{COCH}_3 > \text{HCHO} > \text{CH}_3\text{CHO}$
 - $\text{CH}_3\text{CHO} > \text{CH}_3\text{COCH}_3 > \text{HCHO}$
 - $\text{HCHO} > \text{CH}_3\text{CHO} > \text{CH}_3\text{COCH}_3$

Answer

47. Which of the following proteins is globular?
- Collagen
 - Albumin
 - Myosin
 - Fibroin

Answer

48. Which among the following is a tranquilizer?
- Aspirin
 - Valium

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Answer

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49. Which polymer among the following does not soften on heating?

- A. Bakelite
- B. Polythene
- C. Polystyrene
- D. PVC

Answer

50. Which among the following detergents is non-ionic in character?

- A. Sodium lauryl sulphate
- B. Pentaerythrityl stearate
- C. Cetyl trimethyl ammonium chloride
- D. Sodium n-dodecyl benzene sulphonate

Answer