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Previous Year Paper

Chemistry - 2011

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Match The Following

1. Match the following:

A. Biuret	(i) DNA
B. Urotropine	(ii) Amines
C. Purine	(iii) Urea
D. Purine	(iv) Formaldehyde
E. Hinsberg's reagent	(v) Sulphur

Answer



Fill In the Blanks

2. Fill in the blanks by choosing the appropriate word / words from those given in the brackets:

(concentrated sulphuric acid, methylamine, ethylamine, sp^2 , 2-propanol, s^{-1} , sp^3 , glycol, Cannizzaro's reaction, pyramidal, mol 1-Is-I, Hofmann's degradation, glycerol, concentrated nitric acid, square planar octahedral, concentrated hydrochloric acid)

(i) Nitrogen atom in ammonia undergoes.....hybridisation and the geometry of the molecule is.....

(ii) For a first order reaction, the unit of rate is.....and that of rate constant is.....

(iii) When acetamide is treated with bromine and caustic soda, it gives.....as the main product and the reaction is called.....

(iv)is an example of trihydric alcohol and.....is an example of dihydric alcohol.

(v) Aqua regia is a mixture of.....and.....in the ratio of 3:1.

Answer



Multiple Choice Questions

3. Complete the following statements by selecting the correct alternative from the choice given:-

Out of the following solutions, the one having the highest boiling point will be;
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B. 0.1 M BaCl₂

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C. 0.1MKN₃D. 0.1MKN₃

Answer

4. Complete the following statements by selecting the correct alternative from the choice given:-
75% of a first order reaction was completed in 32 minutes. When was 50% of the reaction completed?
- A. 24 minutes
 - B. 15 minutes
 - C. 8 minutes
 - D. 8 minutes

Answer

5. Complete the following statements by selecting the correct alternative from the choice given:-
When zinc granule is dipped into copper sulphate solution, copper is precipitated because:
- A. Both, copper and zinc have a positive reduction potential.
 - B. Reduction potential of copper is higher than that of zinc.
 - C. Reduction potential of zinc is higher than that of copper.
 - D. Reduction potential of zinc is higher than that of copper.

Answer

6. Complete the following statements by selecting the correct alternative from the choice given:-
Among the following compounds, the one showing geometric isomerism is:
- A. 2-chloro propane
 - B. 2-bromo-2-chlorobutane
 - C. 1,2dichloro ethene
 - D. 1,2dichloro ethene

Answer

7. Complete the following statements by selecting the correct alternative from the choice given:-
Of the following compounds, the one which is a Lewis add is:
- A. PCl₃
 - B. AlCl₃
 - C. NCl₃
 - D. NCl₃

Answer



Short Answer Type

8. Answer the following questions:

0.1 M urea solution shows less depression in freezing point than 0.1 M MgCl₂ solution. Explain.
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9. What is the pH of a solution whose hydroxyl ion concentration is 10^{-2} M? [Answer](#)
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10. [Answer the following questions:](#)
-

If neutral litmus solution is added to sodium acetate solution, what will you observe and why?

[Answer](#)

11. Answer the following questions:

State why the boiling point of HF is very high. [Answer](#)

12. Answer the following questions:

Define piezoelectricity and give one use of piezoelectric crystals.

[Answer](#)

13. 46 gms of ethyl alcohol is dissolved in 18 gms of water. Calculate the mole fraction of ethyl alcohol. (at. wt of C = 12, O = 16, H = 1) [Answer](#)
14. The osmotic pressure of 0.01 molar solution of an electrolyte is found to be 0.65 atm at 27°C . Calculate the van't Hoff factor. What conclusion can you draw about the molecular state of the solute in the solution? [Answer](#)
15. (i) State Faraday's First Law of Electrolysis.
(ii) How many electrons will flow when a current of 5 amperes is passed through a solution for 200 seconds?
[Answer](#)
16. Give reasons for the following:
(i) A reaction/process will be spontaneous when it is exothermic and randomness is increasing.
(ii) The number of hydronium ions increase when one litre of water is added to 1M acetic acid.
[Answer](#)
17. What are semiconductors? What is the effect of increasing temperature on the conductivity of a semiconductor? [Answer](#)
18. A compound AB has a cubic structure and molecular mass 99. Its density is 3.4 g cm^{-3} . What is the length of the edge of the unit cell? [Answer](#)
19. What is the maximum work that can be obtained by the isothermal expansion of one mole of an ideal gas at 273 K from 2.24 dm^3 to 22.4 dm^3 ?
[Answer](#)
20. State the geometry of PCl_5 molecule. Draw its structure. [Answer](#)
21. Give two differences between a sigma bond and a pi bond. [Answer](#)
22. What is meant by common ion effect? [Answer](#)
23. Give the conjugate acid and the conjugate base for NH_3 [Answer](#)
-
24. (i) What is meant by promoter? Give an example.

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(ii) The solubility product of BaSO_4 is 1.5×10^{-9} . Find out its solubility in pure water. [1]

(iii) What is the dissociation constant of 0.1M solution of a weak acid HA which is 4.5% ionized at 20°C ?

Answer

25. Give the IUPAC names for the following: [2]

(i) $\text{Na}_3[\text{AlF}_6]$

(ii) $[\text{Co}(\text{NH}_3)_6]\text{Cl}$

Answer

26. For the complex ion of $[\text{Fe}(\text{CN})_6]^{3-}$:

(i) Show the hybridization diagrammatically.

(ii) Is it an inner orbital complex or an outer orbital complex?

(iii) State its magnetic property.

Answer

27. Give balanced chemical equations for the following:

(i) Chlorine gas is passed through cold, dilute NaOH .

(ii) Sulphur dioxide gas is passed through NaOH solution.

(iii) Zinc is added to sodium argentocyanide solution.

Answer

28. Iron is ferromagnetic in nature. Explain why. Answer

29. State the common oxidation state of:

(i) Lanthanides

(ii) Actinides

Answer

30. In a given transition series, there is no significant change in the atomic radii of elements which with an increase in atomic number. Explain why. Answer

31. Give reactions and the conditions required for preparation of the following compounds:

(i) XeF_6

(ii) XeOF_4

Answer

32. Carry out the following conversions:

(i) Methyl chloride to acetic acid.

(ii) Benzene to benzoic acid

(iii) Ethanol to acetone.

Answer

33. Deficiency of what vitamins will cause the following diseases:

(i) Night blindness.

(ii) Scurvy

Answer

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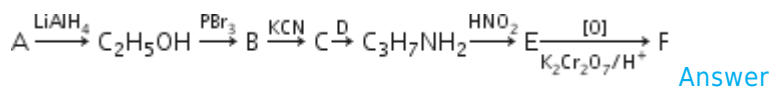
(i) Glycol is heated with oxalic acid at 110°C (383 K).

(ii) Acetamide is heated with sodium hydroxide.

(iii) Acetone reacts with hydrogen in the presence of heated copper.

[Answer](#)

35. Identify A to F :



[Answer](#)

36. Give one good chemical test to distinguish between the following pairs of organic compounds:

(i) Benzaldehyde and acetone.

(ii) Methylamine and dimethylamine.

[Answer](#)

37. Draw the isomers of 2-hydroxy propionic acid.

[Answer](#)

38. Give an example (equation) for each of the following name reactions:

(i) Aldol condensation.

(ii) Reimer-Tiemann reaction.

(iii) Rosenmund's reductions.

[Answer](#)

39. An organic compound A has the molecular formula of $\text{C}_7\text{H}_6\text{O}$. When A is treated with NaOH followed by acid hydrolysis, it gives two products, B and C. When B is oxidised, it gives A. When A and C are each treated separately with PCl_5 , they give two different organic products D and E.

(i) Identify A to E.

(ii) Give the chemical reaction A is treated with NaOH and name the reaction.

[Answer](#)

40. Draw a pair of isomers for each of the following and name the type of isomerism:

(i) C_4H_{10}

(ii) $\text{C}_2\text{H}_2\text{C}_{12}$

(iii) CH_3COCH_3

(iv) $\text{C}_4\text{H}_{10}\text{O}$

[Answer](#)

41. What are polyamides? Give one example of a polyamide and name its monomers. [Answer](#)



Long Answer Type

42. Consider the reaction $2\text{Ag}^+ + \text{Cd} \rightarrow 2\text{Ag} + \text{Cd}^{2+}$. The standard reduction potentials of Ag^+/Ag and Cd^{2+}/Cd are + 0.80 volt and - 0.40 volt, respectively.

(i) Given the cell representation.

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- (iii) What will be the emf of the cell if concentration of Cd^{2+} is 0.1M and Ag^+ is 0.2 M. ?
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- (iv) Will the cell work spontaneously for the condition given in (iii) above?

Answer