



CHEMISTRY

BOOKS - KALYANI CHEMISTRY (ENGLISH)

SAMPLE QUESTION PAPER 5

Questions

1. Fill in the blanks by choosing the appropriate word/words from those given in the brackets :
(oxidation, paramagnetic, two, p-benzoquinone, molecules, diamagnetic, electrochemical constant, one, m-benzoquinone, atoms,, ions, chemical equivalent)

- (i) Phenol on with chromic acid gives
- (ii) Oxygen molecules is due to the presence of unpaired electrons.
- (iii) is the quantity deposited by one coulomb of electricity.
- (iv) The crystal of diamond is made of while that of calcium chloride is made os

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2. Match the following :

Column A	Column B
Thermosetting plastics	Silica gel
Aldose	$a/2k$
Promoter in Haber's process	Aldol condensation
Half-life of zero order reaction	Molybdenum for iron catalyst

A. Image is not present.

B.

C.

D.

Answer:



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Questions Complete The Following Statements By Selecting The Correct Alternative From The Choices Given

1. Chlorobenzene is formed by reaction of chlorine with benzene in the presence of $AlCl_3$. Which of the

following? Species attacks the benzene ring in this reaction ?



Answer: B



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2. In the metallurgy of aluminium

A. Al^{3+} is oxidized to $Al(s)$.

B. Graphite anode is oxidized to carbon monoxide and carbon dioxide.

C. Oxidation state of oxygen changes in the reaction at anode.

D. Oxidation state of oxygen changes in the overall reaction involved in the process.

Answer: B



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3. Which of the following liquid pairs shown a positive deviation from Raoult's law ?

A. Water-hydrochloric acid

B. Acetone - chloroform

C. Water-nitric acid

D. Benzene-methanol

Answer: D



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4. Phenol can be converted to o-hydroxy-benzaldehyde

by :

A. Kolbe reaction

B. Reimer - Tiemann reaction

C. Wurta reaction

D. Sandmeyer's reaction

Answer: B



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Questions Answer The Following Questions

1. The osmotic pressure of 0.01 molar solution of an electrolyte is found to be 0.65 atm at $27^{\circ}C$. Calculate the van.t Hoff factor. What conclusion can you draw about the molecular state of the solute in the solution?



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2. Give chemical tests to distinguish between the following pairs of compounds :

(a) Aniline and Ethylamine (b) Ethylamine and Dimethylamine



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3. Explain why an aqueous solution of potassium hexacyanoferrate (II) does not give the test for ferrous ion.

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4. What is lanthanoid contraction? What are the consequences of lanthanoid contraction?

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5. With the help of a diagram, explain the physical significance of energy of activation (E_a) in chemical

reactions.

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6. What are antihistamines ? Give two examples.

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7. (a) Which one of the following is a food preservative?

Equanil, Morphine, Sodium benzoate

(b) Why is bithional added to soap?

(c) Which class of drugs is used in sleeping pills?

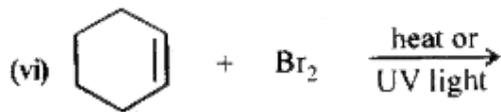
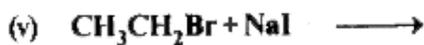
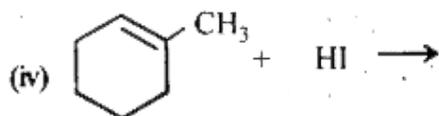
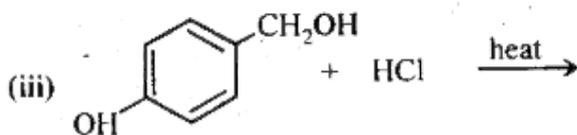
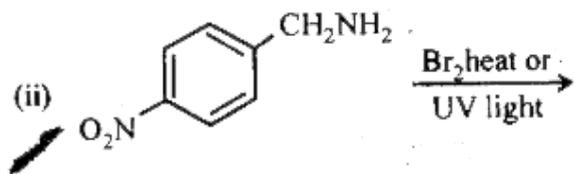
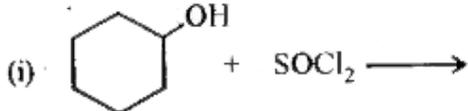
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8. A substance decomposes by following first order kinetics. If 50% of the compound is decomposed in 120 minutes, how long will it take for 90% of the compound to decompose?



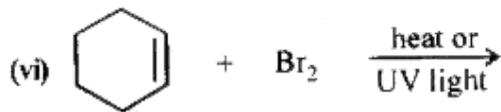
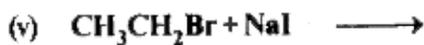
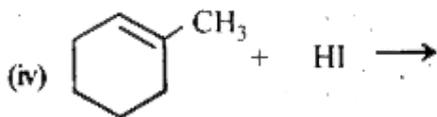
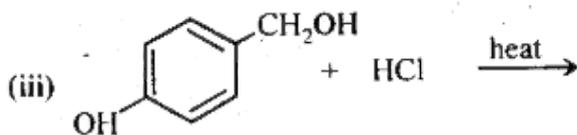
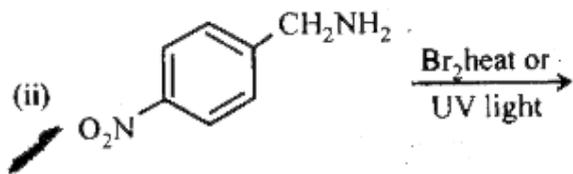
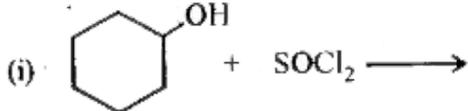
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9. Draw the structures of major monohalo products in each of the following reactions:



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10. Draw the structures of major monohalo products in each of the following reactions:



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

Benzaldehyde and acetone.

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12. Name the functional group common to both glucose and fructose.

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13. Phenyl methyl ether reacts with HI to give phenol and methyl iodide and not iodobenzene and methyl alcohol. Why?

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14. Give reasons :

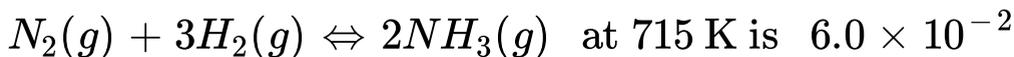
Alcohol acts as weak base.

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15. Give chemical test to distinguish dimethyl ether and ethyl alcohol.

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16. The equilibrium constant for the reaction :



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If, in a particular reaction, there are 0.25 mol L^{-1} of H_2 and 0.06 mol L^{-1} of NH_3 present, calculate the concentration of N_2 at equilibrium.

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17. Ethylene glycol is used as an antifreeze agent. Calculate the amount of ethylene glycol to be added to 4 kg of water to prevent it from freezing at $-6^\circ C$. (K_f for $H_2O = 1.85 \text{ K mol}^{-1}\text{kg}$)

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18. Schottky defect lowers the density of ionic crystals while Frenkel defect does not. Why?

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19. Why solids with F-centres are paramagnetic?

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20. What happens when freshly precipitated $Fe(OH)_3$ is shaken with small amount of $FeCl_3$ solution ?

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21. Why lyophilic colloidal sols are more stable than lyophobic colloidal sols ?

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22. What form freundlich adsorption equation will take at high pressure ?

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23. For the coordination complex ion $[Co(NH_3)_6]^{3+}$

Give the IUPAC name of the complex ion.

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24. Calculate the oxidation number of the underlined atom in the following species.



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25. For the complex ion of $[Co(NH_3)_6]^{3+}$

State the hybridization of the complex.

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26. How is potassium dichromate prepared from a sample of chromite ore ? Give balanced equations for the chemical reactions involved.



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27. An organic compound A with molecular formula C_2H_7N on reaction with nitrous acid gives a compound B. B on controlled oxidation gives a compound C. C reduces Tollens' reagent to give silver mirror and D. B reacts with D in the presence of concentrated sulfuric acid to give a sweet smelling

compound E. Identify A, B, C, D and E. Give the reaction of C with ammonia and name the product.

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28. Name the important ore of silver. Write all the steps and reactions involved in the cyanide process for the extraction of silver from its ore.

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29. State Faraday's first law of electrolysis.

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30. How many electrons will flow when a current of 5 amperes is passed through a solution for 200 seconds ?

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31. Define the following terms :

(a) Molarity

(b) Molal elevation constant (K_b)

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32. A solution containing 15 g urea (molar mass = 60 g mol^{-1}) per litre of solution in water has the same osmotic pressure (isotonic) as a solution of glucose (molar mass = 180 g mol^{-1}) in water. Calculate the mass of glucose present in one litre of its solution.

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33. Sulfur dioxide acts as an oxidising agent as well as a reducing agent. Give one reaction each to show its oxidising nature and its reducing nature.

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34. Write all the chemical reactions involved in the manufacture of sulphuric acid by contact process.

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35. Account for the following

SF_6 exists but OF_6 does not, though both oxygen and sulfur belong to the same group in the periodic table.

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36. Give reasons for the following :

(A) $(CH_3)_3P = O$ exists but $(CH_3)_3N = O$ does not.

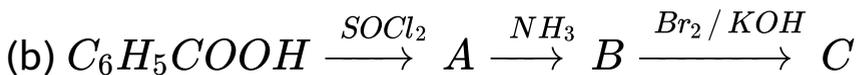
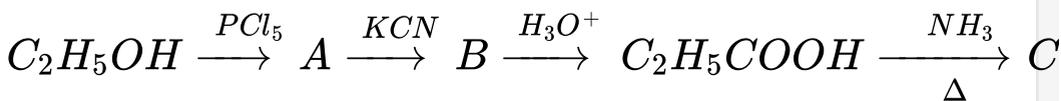
(B) Oxygen has less electron gain enthalpy with negative sign than sulphur.

(C) H_3PO_2 is stronger reducing agent than H_3PO_3 .

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37. Identify the compounds A, B and C :

(a)



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38. Give one good test to distinguish between the following pair compounds : oxalic acid and benzoic acid.



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39. How will you carry out the following conversion :
Acetic acid to propionic acid ?



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40. How will you bring about following conversion :

Formic acid to oxalic acid ?



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