



## CHEMISTRY

### BOOKS - KALYANI CHEMISTRY (ENGLISH)

#### SELF ASSESSMENT PAPER 02

#### Questions

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

(greater, trigonal, tetrahedral, oxidising, reducing, electropositivity, cations, atoms, anion,  $\text{ohm}^{-1}\text{cm}^2$ ,  $\text{ohm}^{-1}\text{cm}^{-1}$ , electronegativity, smaller).

Q. In ether, the bond angle is lightly \_\_\_ than the \_\_\_ angle.



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

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Q. Halogens are strong \_\_\_ agents because of their high \_\_\_

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Q. The defect in which \_\_\_ and \_\_\_ missing in the stoichiometric ratio of compound is known as Schottky defect.

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Q. In ether, the bond angle is lightly \_\_\_ than the \_\_\_ angle.



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5. For a dissociated solute in solution, the value of van't Hoff factor is :

- 1) zero
- 2) one
- 3) greater than one
- 4) less than one

A. Zero

B. One

C. Greater than one

D. Less than one

**Answer:**

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6. The product formed when aniline is warmed with chloroform and caustic potash is :

A. Phenyl chloride

B. Methyl isocyanide

C. Phenyl isocyanide

D. Nitrophenol

**Answer:**

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7. An ether is more volatile than alcohol having the same molecular formula. This is due to

- A. Dipolar character of ethers
- B. alcohols having resonance structures
- C. intra-molecular hydrogen bonding in alcohols
- D. inter-molecular hydrogen bonding in alcohols

**Answer:**

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8. Electrolytic refining is used to purify which of the following metals?

- A. Cu and Zn
- B. Ge and Si
- C. Zr and Ti

D. Zn and Hg

**Answer:**

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**9. Match the following:**

(i) Acetaldehyde — Glycine

(ii) Zwitter ion— Due to the neutralization Of Charge

(iii) Number of collisions-Iodoform

(iv) Coagulation-Energy barrier

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**10. Write the formulae of the following coordination compounds :**

(i) Potassium tetracyanonickelate(0)

(ii) Triamine trinitrocobalt (III)

(iii) Tetraammine dichloroplatinum (IV) tetrachloroplatinate (II)

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11. Acetamide is amphoteric in nature. Give two equations to support this statement. \* \*

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

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13. A solution is prepared by dissolving three moles of glucose in one litre of water and a solution Y is prepared by dissolving 1.5 moles of sodium chloride in one litre of water. Will the osmotic pressure of X be higher, lower or equal to that of Y? Give a reason for your answer.

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14. What is activation energy.

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15. The slope of the line in the graph of  $\log k$  ( $k$  = rate constant) versus  $\frac{1}{T}$  is  $-5841$ . Calculate the activation energy of the reaction.

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16. Define the following:

- (a) Anionic detergents
- (b) Limited spectrum antibiotics
- (c) Antiseptics

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17. Define the following terms with a suitable example in each:

(i) Broad-spectrum antibiotics.

(ii) Disinfectants

(iii) Cationic detergents.

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18. Give balanced equations and explain what happens when glycerol reacts with conc.  $H_2SO_4$ .

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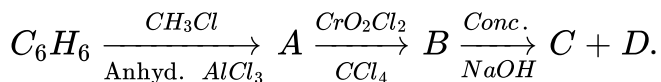
19. State the reagents for the following conversions : Benzene  $\xrightarrow{(A)}$

Nitrobenzene  $\xrightarrow{(B)}$  Aniline  $\xrightarrow{(C)}$  Aniline Hydrochloride  $\xrightarrow{(D)}$

Benzenediazonium chloride.

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20. Identify the product A,B,C and D



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21. The deficiency of which vitamin will cause the following diseases:

(i) Scurvy

(ii) haemorrhages.

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22. (i) Write the mathematical expression relating the variation of rate constant of a reaction with temperature.

(ii) How can you graphically find the activation energy of the reaction from the above expression ?

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23. Give one chemical test to distinguish between the following pairs of compounds :

Ethanol and 2 propanol.

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24. The rate of a reaction quadruples when the temperature changes from 293 K to 313 K. Calculate the energy of activation of the reaction assuming that it does not change with temperature

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25. Albumins are the most abundant proteins in blood. At  $25^{\circ}C$ , 3.5 g of albumin in 100 ml of water produces an osmotic pressure of 0.014 atm. What is the molecular weight of albumin?

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**26.** In a crystal of diamond :

- (i) How many carbon atoms are present per unit cell ?
- (ii) What type of lattice does diamond crystallize in ?
- (iii) How many carbon atoms surround each carbon atom ?
- (iv) How are they arranged ?

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**27.** Name the two groups into which phenomenon of catalysis can be divided. Give an example of each group with the chemical equation involved.

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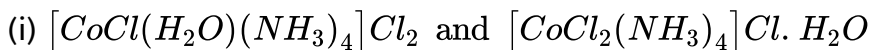
**28.** Why the freezing point depression ( $\Delta T_f$ ) of 0.4 M NaCl solution is nearly twice than that of 0.4M glucose solution ?

Among                  equimolal                  aqueous                  solutions                  of

$MgCl_2$ ,  $NaCl$ ,  $FeCl_2$  and  $C_{12}H_{22}O_{11}$ , which has high osmotic pressure? Why?

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29. (a) Name the types of isomerism shown by the following pairs of compounds:



(b) Write the IUPAC name of  $[Co(en)_2Cl_2]^+$  ion and draw the structure of its geometrical isomers.

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30. Explain the following :

The paramagnetic character in 3d-transition series elements increases upto Mn and then decreases.

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31. How can the following conversions be brought about :

Ethanol to methylamine.

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32. (i) Name the element of 3d transition series which shows maximum number of oxidation states. Why does it show so ?

(ii) Out of  $Cr^{3+}$  and  $Mn^{3+}$  which is a stronger oxidising agent and why?

(iii) Why is zinc not regarded as a transition element ? (At. no. Zn=3)

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33. (a) Describe the method of refining crude nickel metal.

(b) Name the common element present in the anode mud in electrolytic refining of copper. Why are they present in anode mud?



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

What is the standard cell emf,  $E^\circ$  ?



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35. Two metallic elements A and B have the following standard oxidation potentials :

$A = 0.40V$ ,  $B = -0.80V$ . What would you expect if element A was added to an aqueous salt solution of element B ? Give a reason for your answer.



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36. (A) For the molecule  $IF_7$

- (i) Draw the structure of the molecule.
- (ii) State the hybridization of the central atom.
- (iii) State the geometry of the molecule.

(B) Give reactions and conditions required for the preparation of the following compounds :

(i)  $XeF_6$

(ii)  $XeOF_4$ .

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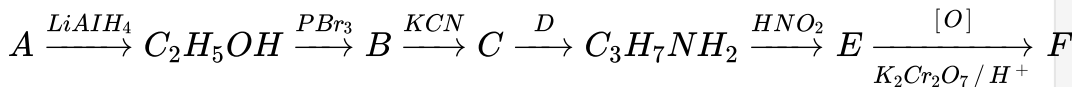
37. Write balanced chemical equations for the reaction:

Chlorine is passed through hot concentrated NaOH solution.

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38. (i) Identify A to F:



(ii) How can the following conversion be brought about : propanoic acid to ethylamine.

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39. An organic compound A has the molecular formula of  $C_7H_6O$ .

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.

Give the chemical reaction when A is treated with NaOH and name the reaction.

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