



CHEMISTRY

BOOKS - ARIHANT PUBLICATION

SAMPLE PAPER 4

Group A Choose And Write The Correct Answer

1. Butter is a colloidal solution of

A. solid-solid

B. liquid-solid

C. solid-liquid

D. gas-solid

Answer: B



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2. Which one of the following is not present in RNA ?

A. Uracil

B. Thymine

C. Ribose

D. Phosphate

Answer: B



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3. When constituent particles are present only at the corners of a unit cell, it is called

A. primitive unit cell

B. centred unit cell

C. body-centred unit cell

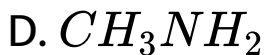
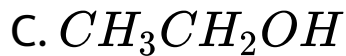
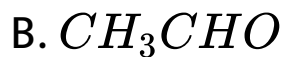
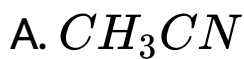
D. face-centred unit cell

Answer: A



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4. The product formed by the reaction of acetamide with bromine in the presence of NaOH is



Answer: D



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5. The highest oxidation state exhibited by a transition metal is

A. + 7

B. + 8

C. + 6

D. + 5

Answer: B



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6. The time required for 100 % completion of a zero order reaction is

A. ak

B. $\frac{a}{2k}$

C. $\frac{a}{k}$

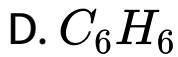
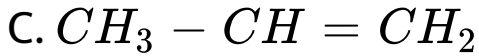
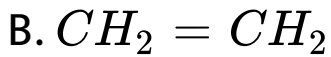
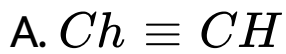
D. $\frac{2k}{a}$

Answer: C



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7. Which of the following yield 2 moles of formaldehyde on ozonolysis?



Answer: B



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Group A

1. Hydrofluoric acid exists as a molecule.



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2. _____ is used to preserve biological specimens.



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3. The process of converting alkyl halides into alcohols involves reaction.



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4. Write the IUPAC name of the ionisation isomers of $[Co(NH_3)_5SO_4]Br$.



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5. What type of semiconductor is produced when silicon is doped with boron?



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6. What is meant by molality of the solution?



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7. Define order of a reaction.



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Group B

1. The edge of the face centred cubic unit cell of aluminium is 404 pm. Calculate the radius of aluminium atom.



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2. Write the reactions involved in the following:

Hell-Volhard Zelinsky reaction



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3. Write the reactions involved in the following:

Decarboxylation reaction



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4. What is the role of graphite rods in the electrometallurgy of aluminium?



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5. What happens when

PCl_5 is heated



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6. What happens when

H_3PO_3 is heated?



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7. Define osmotic pressure ? How is the osmotic pressure related to the concentration of a solute in a solution?



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8. Write the main structural difference between DNA and RNA. Of the two bases, thymine and uracil, which one is present in DNA?



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9. What is the primary and secondary valency of chromium in the complex ion, dichlorodioxalatochromium(III) ?



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10. What is the order of acidic character of 1° , 2° and 3° alcohols ? Give reason.



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11. Why are antioxidants used in the food?



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12. Explain the difference between the average rate and instantaneous rate of a chemical reaction.



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13. How are the following properties of crystals affected by Schottky and Frenkel defects?

(i) Density (ii) Electrical conductivity



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14. Write the reaction for the formation of each of the following:

(a) Dichloromethane

(b) Phosgene



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15. How is bakelite made and what is its major use ? Why is it called thermo-setting polymer?



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16. Why does a native protein loses its biological activity on heating?



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17. How do size of particles of adsorbent, pressure of gas and prevailing temperature influence the extent of adsorption of a gas on a solid?



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18. Write the difference between ideal and non-ideal solutions.



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19. Give the industrial uses of methanol, ethanol and phenol.



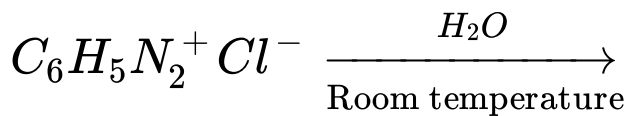
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20. Complete the following reactions



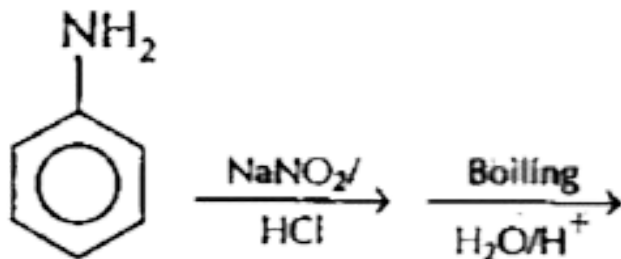
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21. Complete the following reaction.



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22. Complete the following reactions



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23. The outer electronic configurations of two members of the lanthanoid series are as follow: $4f^1 5d^1$ and $4f^7 5d^0 6s^2$. What are their atomic numbers? Predict the oxidation states exhibited by these elements in their compounds.



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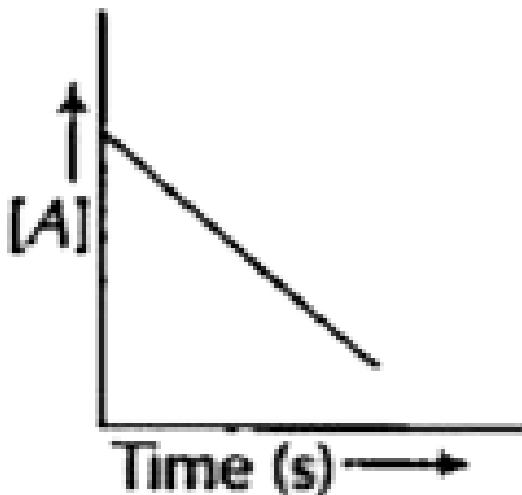
24. Draw all the possible isomers (structural and stereoisomeric) having the composition $CrBr_2Cl(NH_3)_4$.



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Group C

1. Consider the reaction, $A \xrightarrow{k} P$. The change in the concentration of A with time is shown in the following plot:



- (a) Derive the expression for the time required for the completion of the reaction.
- (b) Predict the order of the reaction.



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2. The rate constant for a first order reaction is 60 s^{-1} . How much time will it take to reduce the initial concentration of the reactant to its 1/16th value?



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3. State the relationship amongst cell constant of a cell resistance of the solution in the cell and conductivity of the solution. How is molar conductivity of the solution is related to

conductivity of its solution ?

A voltaic cell is set up at $25^{\circ}C$ with the following half cells

Al / Al^{3+} (0.001M) and Ni / Ni^{2+} (0.50M)

Calculate the cell voltage.

$$\left[\begin{array}{l} E^{\circ}_{Ni^{2+} / Ni} = -0.25V, \\ E^{\circ}_{Al^{3+} / Al} = -1.66V \\ E^{\circ}_{Cell} = 1.4602V \end{array} \right]$$



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4. An aldehyde $A(C_{11}H_8O)$ which does not undergo self aldol condensation but gives

benzaldehyde and two moles of B on ozonolysis. Compound B on oxidation with silver ions gives oxalic acid. Identify compound A and B.



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5. Haloarenes are much less reactive than haloalkanes towards nucleophilic substitution reaction. Give reason.



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6. Describe the mechanism of acid catalysed dehydration of ethanol to yield ethene.

How will you convert

(i) propene to propan-2-ol?

(ii) phenol to 2, 4, 6-trinitrophenol ?



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7. Square planar complexes of MX_2L_2 type with coordination number of 4 exhibit geometrical isomerism whereas tetrahedral complexes with similar composition do not.

Why?

Justify the formation of a low spin complex and a high spin complex taking the examples of $[Fe(CN)_6]^{3-}$ and $[FeF_6]^{3-}$ on the bases of "crystal field splitting energy". (Δ_0)



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