

- A. All Questions are **Compulsory**. Study, Assignments, Solved Previous Year Papers . Questions and Answers. Free Forever.
- B. Questions Number **1 to 5** are **Very Short Answer** Questions and carry **1 Mark** each.
- C. Questions Number **6 to 10** are **Short Answer** Questions and carry **2 Marks** each.
- D. Questions Number **11 to 22** are also **Short Answer Questions** and carry **3 Marks** each.
- E. Question Number **23** is a **Value Based Question** and carry **4 Marks**.
- F. Questions Number **24 to 26** are **Long Answer Questions** and carry **5 Marks** each.
- G. Use log tables, if necessary. Use of **Calculators** is **Not** allowed.

Section A

1

What is the effect of pressure on NaCl type crystals?

[1]

2

What do you mean by adsorbent and adsorbate?

[1]

3

Why magnesium oxide is used for the lining in steel making furnace?

[1]

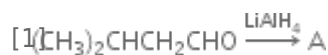
4

Write IUPAC name of the following: Tert-butyl chloride.

[1]

5

Write the structure of compound A in the following reactions:



6

What is expected value of Van't Hoff factor for $\text{K}_3[\text{Fe}(\text{CN})_6]$ in dilute solution?

[2]

7

State any one condition under which a bimolecular reaction may be kinetically of first order?

[2]

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8

Why reduction temperature of reduction?

[2]

9

Why does NO_2 dimerise?

[2]

10

Arrange the following compounds in increasing order of their acid strength.

Propan-1-ol, 2, 4, 6-trinitrophenol, 3-nitro-phenol, 3, 5-dinitrophenol, phenol, 4-methyl phenol.

[2]

11

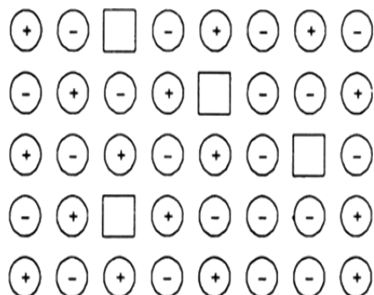
Examine the illustration of a portion of the defective crystal given below and answer the following questions:

(i) What are these types of vacancy defects called?

(ii) How is the density of a crystal affected by these defects?

(iii) Name one ionic compound which can show this type of defect in the crystalline state.

(iv) How is the stoichiometry of the compound effected?



[3]

12

The rate of reaction



is double when concentration of Cl_2 is doubled and it becomes 8 times when concentrations of both NO and Cl_2 are doubled. Deduce the order of this reaction.

[3]

13

Prove that the relative lowering of vapour pressure is equal to the mole fraction of non-volatile solute in the solution.

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14

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What is de-emulsification ? Name two demulsifiers.

[3]

15

A blackish brown coloured solid 'A', when fused with alkali hydroxide in presence of air produces a dark green coloured compound 'B'. When electrolytic oxidation in alkaline medium gives a dark purple coloured compound. Identify A, B and C and write the reaction involved.

[3]

16

What do you understand by nucleophilic substitution reaction? Why do haloalkanes undergo nucleophilic substitution reaction?

[3]

17

Give reasons:

- (i) Mn shows the highest oxidation state of +7 with oxygen but with fluorine, it shows the highest oxidation state of +4.
- (ii) Transition metals show variable oxidation states.
- (iii) Actinoids show irregularities in their electronic configurations.

[3]

18

A metal ion M^{n+} having d^4 valence electronic configuration combines with three didendate ligands to form complex compound. Assuming $\Delta_0 > P$.

- (i) Draw the diagram showing d-orbital splitting during this complex formation.
- (ii) Write the electronic configuration of the valence electrons of the metal M^{n+} in terms to t_{2g} , and e_g .
- (iii) What type of hybridisation will M^{n+} ion have?
- (iv) Name the type of isomerism exhibited by this complex.

[3]

OR

(i) Explain Study Assignments, Solved Previous Year Paper, Questions and Answers, Free Example. How is tetrahedral complexes with simple ligands do not exhibit geometrical isomerism?

(ii) Using valence bond theory, predict the shape and magnetism (paramagnetism) or diamagnetism of $[\text{Co}(\text{CO})_4]^-$ (at. no. of Co = 27)?

(iii) How is stability of coordination compounds determined in aqueous solution?

[3]

19

Arrange the isomeric compounds:

(i) Ethyldimethyl amine

(ii) n-butyl amine

(iii) diethyl amine

in order of decreasing boiling point and give reason.

[3]

20

Write the names and structures of the monomers of the following polymers

(i) Nylon-6, 6

(ii) PHBV

(iii) Neoprene

[3]

21

What are the following substances? Give one example of each.

(i) Food preservatives

(ii) Synthetic detergents

(iii) Antacids

[3]

22

(i) Write the IUPAC name of the complex $[\text{Cr}(\text{NH}_3)_4\text{Cl}_2]\text{Cl}$.

(ii) What type of isomerism is exhibited by the complex $[\text{Co}(\text{en})_3]^{3+}$?

(en = ethane-1,2-diamine)

(iii) Why is $[\text{NiCl}_4]^{2-}$ paramagnetic but $[\text{Ni}(\text{CO})_4]$ is diamagnetic?

(At. nos. : Cr = 24, Co = 27, Ni = 28)

[3]

23

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After watching a programme on TV about the presence of carcinogens (cancer causing agents)

Potassium bromate and Potassium iodate in bread and other bakery products, Ritu a class XII student decided to aware others about the adverse effects of these carcinogens in foods. She

consulted the school principal and requested him to instruct canteen contractor to stop selling sandwiches, pizza, burgers and other bakery products to the students. Principal took an immediate action and instructed the canteen contractor to replace the bakery products with some proteins and vitamins rich food like fruits, salads, sprouts etc. The decision was welcomed by the parents and students.

After reading the above passage, answer the following questions :

- (i) What are the values (at least two) displayed by Ritu?
- (ii) Which polysaccharide component of carbohydrates is commonly present in bread?
- (iii) Write the two types of secondary structure of proteins.
- (iv) Give two examples of water soluble vitamins.

[4]

24

Depict the galvanic cell in which the reaction

$\text{Zn(s)} + 2\text{Ag}^+(\text{aq}) \rightarrow \text{Zn}^{2+}(\text{aq}) + 2\text{Ag(s)}$ takes place. Further show:

- (i) Which of the electrode is negatively charged?
- (ii) The carriers of the current in the cell.
- (iii) Individual reaction at each electrode.

[5]

OR

Show that the electrical work obtainable from a galvanic cell is given by the expression.

$$\Delta G^\circ = -nFE^\circ_{\text{cell}}$$

[3]

OR

What is a salt bridge? What is its significance?

[2]

25a

Give an equation in which the Xenon fluoride act as a

- (i) fluoride donor (ii) fluoride acceptor.

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25b

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State reasons for each of the following happenings:

- (i) Sulphur vapour exhibits some paramagnetism.
(ii) Unlike phosphorus nitrogen shows little tendency for catenation.

[2]

25c

Give reasons for the following:

CN^- ion is known but CP^- is not known.

[1]

OR

Using VSEPR theory, predict the structures of SO_3^{2-} , IF_7^- , XeF_2 , ClO_4^- , ICl_4^- and IBr_2^- .

[5]

26a

Give the product of the reaction of:



[1]

26b

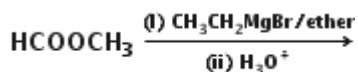
Predict the organic products of the following:



[2]

26c

Predict the organic products of the following:



[2]

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How will you make the following conversions?

Benzoic acid into 2-phenyl propan-2-ol.

[2]

OR

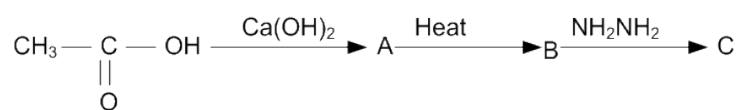
How will you make the following conversions?

Ethyl acetate into but-2-enal.

[2]

OR

Identify (A), (B) and (C) in the following reaction:



[1]