Sample Paper-05
Chemistry (Theory)
Class – XI

Time allowed: 3 hours **Maximum Marks: 70**

General Instructions:

a) All the questions are compulsory.
b) There are **26** questions in total.
c) Questions **1** to **5** are very short answer type questions and carry **one** mark each.
d) Questions **6** to **10** carry **two** marks each.
e) Questions **11** to **22** carry **three** marks each.
f) Questions **23**is value based question carrying **four** marks.
g) Questions **24**to **26** carry **five** marks each.
h) There is no overall choice. However, an internal choice has been provided in one question of two marks, one question of three marks and all three questions in five marks each. You have to attempt only one of the choices in such questions.
i) Use of calculators is **not** permitted. However, you may use log tables if necessary.

1. If a metal is higher than a particular metal in electrochemical series, will it be stronger reducing agent or weaker reducing agent? Why?
2. If the critical temperature for carbon dioxide and methane are 31.1^0C and – 81.9^0C respectively, then which of these has strong intermolecular forces? Give reason.
3. Which of these contain the largest number of atoms – 1.0 g Li(s) and 1g Na(s)?
4. Predict the shape of the PH_3 molecule according to VSEPR theory.
5. Give reason: "Metallichydrides are usedforstoringhydrogen".
6. (a)Name the energy which arises due to motion of atoms or molecules in a body.
   (b) How is this energy affected when the temperature is increased?

   Or

   Give the relationship between isothermal and free expansion of an ideal gas.
7. Predict the formulae of the stable binary compounds that would be formed by the combination of the following pairs of elements:
   (a) Element 71 and F
   (b) Al and I
   (c) Si and O
   (c) P and F.
8. Why the bottle containing hydrogen peroxide should be cooled before opening?
9. Why Be and Mg does not give colour to flame than the alkaline earth metals?
10. Calculate the molality of the solution if the density of 3M solution of NaCl is 1.25g/mL.
11. What happens when
    (a) Sodium metal is dropped in water?
    (b) Sodium metal is heated in free supply of air?
    (c) Sodium peroxide dissolves in water?
12. Justify giving reactions that among halogens, fluorine is the best oxidant and among hydrohalic compounds, hydroiodic acid is the best reductant?
13. Write the balance equation for the following:

Material downloaded from http://myCBSEguide.com and http://onlineteachers.co.in
Portal for CBSE Notes, Test Papers, Sample Papers, Tips and Tricks

(i) $BF_3 + LiH \rightarrow$

(ii) $B_2H_6 + H_2O \rightarrow$

(iii) $NaH + B_2H_6 \rightarrow$

(iv) $H_3BO_3 \xrightarrow{\Delta}$

(v) $Al + NaOH \rightarrow$

(vi) $B_2H_6 + NH_3 \rightarrow$

14. Explain the principle of paper chromatography?
15. Write a brief note on the following environmental terms:
    (i) Acid rain
    (ii) Eutrophication
    (iii) Green Chemistry
16. A liquid is in equilibrium with its vapour in a sealed container at a fixed temperature. The volume of the container is suddenly increased.
    (a) How do rates of evaporation and condensation change initially?
    (b) What is the initial effect of the change on vapour pressure?
17. (a) How would you distinguish between $BeSO_4$ and $BaSO_4$?
    (b) Which is thermally most stable alkaline earth metal carbonate among $MgCO_3$, $CaCO_3$, $SrCO_3$, $BaCO_3$? Give reasons.
18. Derive the structure of:
    (a) 2-Chlorohexane
    (b) Pent-4-en-2-ol
    (c) 3- Nitrocyclohexene
    (d) Cyclohex-2-en-1-ol

    Or

    Why NH_3 has a higher dipole moment than NF_3?
19. Why is the entropy of a substance taken as zero at 0 K? calculate the standard Gibbs free energy change for the reaction

    $N_2(g) + 3H_2(g) \Leftrightarrow 2NH_3(g)$ at 298 K.

    $N_2(g) + 3H_2(g) \Leftrightarrow 2NH_3(g)$ at 298 K.

    The Value of equilibrium constant for the above reaction is 6.6×10^5. [R=8.314 J K^{-1} mol^{-1}]
20. Define the following:
    (a) Critical temperature
    (b) Avogadro law
    (c) Charles Law
21. Define:
    (i) Lattice enthalpy
    (ii) Bond length
    (iii) Bond angle.
22. (i) Name the class of hydrides to which H_2O and NaH belong.
    (ii) What do you understand by the term hydride gap?
    (iii) What do you mean by 15 volume H_2O_2 solution?
23. Ram uses urea and DAP for his crops whereas Shyam uses compost. Ammonia is prepared by Haber's process. It is used for making fertilizers. If it is used in excess, it is harmful for crops.
    (i) What is DAP?
    (ii) What can be done with waste products?

myCBSEguide.com

(iii) What is the use of avoiding excess of fertilizers?
(iv) Natural manure is preferred than synthetic fertilizers. Why?

24. (a) Convert :
    (i) Benzene to p-nitrobromobenzene
    (ii) Ethyl chloride to ethene.
    (b) Give mechanism of addition of HBr to propene.
    (c) Write a note on Friedel-Crafts alkylation.

Or

Balance the following equation in acidic medium by half reaction method.

$Cr_2O_7^{2-} + C_2H_4O \rightarrow C_2H_4O_2 + Cr^{3+}$

25. From the structures given below, answer the questions.
    (i) $CH_3 - CH_2 - CH\ (OH) - CH_3$
    (ii) $(CH_3)_2 - C\ (OH) - CH_3$
    (iii) $CH_3 - CH_2 - CH_2 - CH_2 - OH$
    (iv) $CH_3 - O\ (CH_3) - CH - CH_3$
    (v) $CH_3 - O - CH_2 - CH_2 - CH_3$
    (vi) $CH_3 - CH_2 - O - CH_2 - CH_3$
    (vii) $CH_3 - CH\ (CH_3) - CH_2 - OH$
    (a) The pair of compounds that represent chain isomerism.
    (b) The pair of compounds that represent position isomerism.
    (c) The pairs of compounds which are functional group isomers.
    (d) The compounds that form pairs of metamers.
    (e) Distinguish between position and functional isomerism with an example.

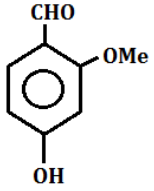
Or

Convert the following:
(a) Benzene to Benzoic acid
(b) Bromoethane to Butan-1-ol
(c) Ethene to Propene
(d) Ethyne to Methane
(e) Propene to Propan-2-ol

26. (a) Give one methodforindustrialpreparationandoneforlaboratorypreparation ofCOandCO_2each.
    (b) Select themember(s) of group 14that (i) forms the most acidic dioxide (ii) used as semiconductors.
    (c) Explain structure ofDiborane.

Or

(a) Identify the functional groups in the following:



(b) Draw the bond notation of heptan-4-one.
(c) Give the possible isomers for mono substituted
(d) Give the possible isomers for di substituted benzene?

myCBSEguide.com