

## **CBSE Class 11 Chemistry Sample Paper Set 3**

**Maxi. 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 three marks each.
- e) Questions 11 to 22 carry three marks each.
- f) Questions 23 is value based questions carrying four marks.
- e) Questions 24 to 26 carry five marks each.
- f) Question 23 is value based question carrying four marks.
- g) Question 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. Draw the structure of

a) 2, 3 – Dimethyl pentane

b) 4 – Phenyl but – 1- ene

2. If a tank is full of water coming in and out at the same rate, then what will happen to the level of water

1. Draw the structure of

a) 2, 3 - Dimethyl pentane

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2. If a tank is full of water coming in and out at the same rate, then what will happen to the level of water in a tank?

3. Express 32.392800 to four significant figures.

4. Write the correct symbol for the nucleus with:

i) Atomic number 56 and mass number 138.

ii) Atomic number 26 and mass number 55.

5. Why is Ga smaller in size than Al?

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
  - d) 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. (a) Give the importance of measuring BOD of a water body.
- (b) What is desirable concentration of fluoride ion pH of drinking water?
- (c) Give the harmful effect of nitrogen dioxide.

12. (a) Define:

i) Intensive properties

ii) Adiabatic process

b) Derive  $\Delta G = -T\Delta S_{total}$  from the relationship  $G = H - TS$ .

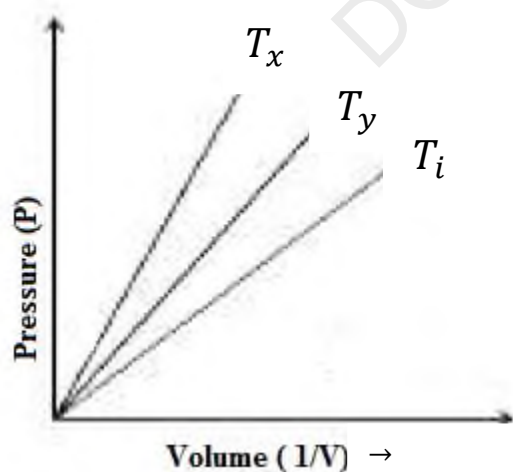
**13.** We know that 75% of solar energy reaching the earth, is absorbed by earth's surface increases its temperature. The rest of heat radiates back to the atmosphere. Some of the heat is trapped by gases such as  $CO$ ,  $CH_4$ ,  $O_3$ , CFC's and water vapours present in the atmosphere. This causes global warming.

a) Suggest some measures to decrease  $CO$  gas in the atmosphere.

b) Give a method to save ozone layer.

c) Will the use of solar energy solve our problems? Comment.

14. Comment on the graph below.



15. If the density of 3M solution of NaCl is 1.25g/ml, calculate the molality of the solution.
16. Calculate the standard enthalpy of formation of one mole of  $CH_3OH(l)$ , if the combustion of one mole of methanol takes place at 298 K and 1 atm and after combustion  $CO_2(g)$  and  $H_2O(l)$  are produced and 726 kJ of heat is liberated. Assume that the standard enthalpies of formation of  $CO_2(g)$  and  $H_2O(l)$  are -393kJ/mol and -286 kJ/mol respectively.
17. What are the uses of sodium carbonate?
18. Describe in detail the expanded octet with suitable examples.
19. How would you prepare alkanes from alkenes?
20. (a) Calculate the concentration of hydroxyl ion in 0.1 M solution of ammonium hydroxide having  $K_b = 1.8 \times 10^{-5}$ , if  $K_{sp}$  value of two sparingly soluble salts  $Ni(OH)_2$  and  $AgCN$  are  $2 \times 10^{-15}$  and  $6.0 \times 10^{-17}$  respectively.
- (b) Which salt is more soluble ?

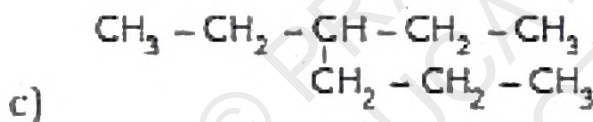
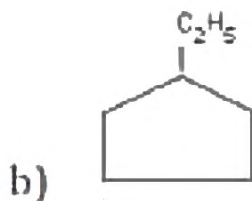
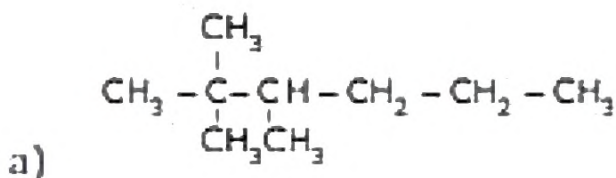
Or

- a) When certain buffer is made by mixing sodium formate and formic acid in water, explain how it neutralizes an addition of a small amount of an acid or a base.

b) When a basic buffer is made by mixing ammonium hydroxide and ammonium nitrate in water, explain how it resists change in its pH on addition of a small amount of an acid or a base.

21. (i) Draw the structural isomers of pentane.

(ii) Give the IUPAC names of the following compounds.



22. What are the factors that made Thomson to argue about the amount of deviation of the particles from their path in the presence of electrical or magnetic field depends upon?

23. During an educational trip, class XI students saw a beautiful lake in a village. They noticed that some villagers were washing clothes around the lake and at some places waste material from houses was destroying its beauty. After a few years back, one of the students went to the same lake again and saw the lake was covered with algae, stinking smell and the water becomes unusable. Explain the reason for this condition.

**24. a) Convert:**

i) Benzene to p-nitrobromobenzene

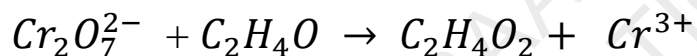
ii) Ethyl chloride to ethene.

b) Give mechanism of addition of HBr to propene.

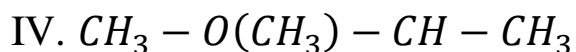
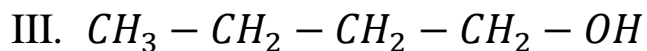
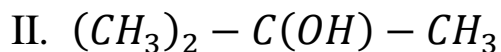
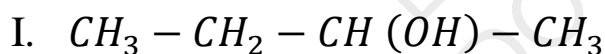
c) Write a note on Friedel- Crafts alkylation.

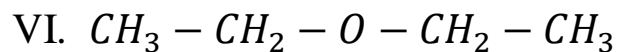
Or

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



25. From the structure given below, answer the questions.





- The pair of compounds that represent chain isomerism.
- The pair of compounds that represent position isomerism.
- The pairs of compounds which are functional group isomers.
- The compounds that form pairs of metamers.
- Distinguish between position and functional isomerism with an example.

Or

Convert the following.

- Benzene to Benzoic acid
- Bromoethane to Butan – 1- ol
- Ethene to Propene
- Ethyne to Methane
- Propene to Propan – 2- ol



26. (a) Give one method for industrial preparation and one for laboratory Preparation of CO and  $CO_2$  each.

(b) Select the member(s) of group 14 that

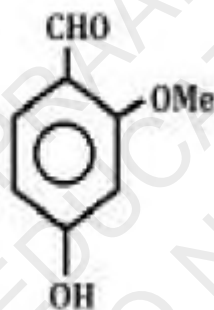
i) forms the most acidic dioxide

ii) used as semiconductors.

(c) Explain structure of Diborane.

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?