

CHEMISTRY

Time 1 Hour

Max. Marks: 60

Instructions:

- (1). *Answer must be written either in English or the medium of instruction of the candidate in high school.*
 - (2). *There will be no negative marking.*
 - (3). *Use of calculators or graph papers is not permitted*
 - (4). *There are TWENTY EIGHT (28) questions. Answer all the questions.*
 - (5). *Each question carries 2 marks except questions 7, 15 carries 4 marks each..*
 - (6). **Support your answer with relevant chemical equations.**
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1. What is the difference between physical property and chemical property? Explain with suitable examples.
2. What are the factors that decide the physical and chemical properties of a substance?
3. Every substance exists in three different physical states i. e. gas, liquid and solid. What are the factors that decide the physical state of the substance under given condition?
4. What are skeletal, balanced and thermo chemical equations. What is the advantage of one over other? Explain with suitable examples.
5. What are the simple tests that are used to decide the purity of a chemical sample?
6. Define the limiting reagent and excess reagent. What is the significance of limiting reagent in predicting the amount of product obtained in a reaction?
7. (a) Why is theoretical yield of a reaction determined only by amount of the limiting reagent?
(b) Why actual yield of a reaction is almost always smaller than theoretical yield.
8. Why is molarity a convenient concentration unit in chemistry, and derive the equation for calculating molarity.
9. Why is dangerous to add water to a concentrated acid such as sulphuric acid in a dilution process?
10. Define disproportionation reaction. What is the requirement for an element to undergo disproportionation.? Give any two example of disproportionation.
11. Burning of methane in O₂ is a highly exothermic reaction yet mixture of methane and oxygen gas can be kept without any apparent change. Explain.
12. What is the difference between a non – electrolyte, electrolyte and a weak electrolyte, strong electrolyte? Explain with suitable examples.

13. CO_2 is a non-combustible and non-supporter of combustion under normal conditions. But it supports the combustion under high temperature conditions. Explain.
14. Ionic product of electrolytic substance exceeds its solubility product precipitation takes place. Why?
15. (a) Define p^{H} . Why do chemists normally choose to discuss acidity of a solution in terms of p^{H} rather than hydrogen ion concentration?

(B) p^{H} of solution is 6.7. From this statement alone, can you conclude that the solution is acidic? If not what additional information would you need.
16. What is the chemical / structural difference between normal salt and acid salt. Under what conditions these salts are formed.
17. What are the reaction factors that are responsible for reversibility and irreversibility of chemical reaction and how?
18. Carbon and Silicon belong to IV-A Group of the periodic table and have the same valence electron configuration $ns^2 np^2$. Why silicon dioxide (SiO_2) has much higher melting point than CO_2 ?
19. Alkenes, alkynes are called as unsaturated compounds. Explain. Give two suitable examples, which support unsaturation property of above compounds.
20. Aldehydes and ketones have same general molecular formula but they show different properties. Explain. Give two suitable examples.
21. All colours are not used as dyes. Explain.
22. Amino acids are the organic compounds. But they are highly soluble in H_2O . Explain.
23. Brown ring test – the confirmatory test of nitrate, freshly prepared aq FeSO_4 is used. What is the role of FeSO_4 ?
24. KI on treatment with H_3PO_4 , gas HI is formed but with H_2SO_4 it forms I_2 gas. Explain.
25. Why aqueous solution of CuSO_4 is blue? This solution on stirring with Zn spoon slowly fades away. Explain.
26. Molten NaCl in electrolysis with Pt electrodes produce sodium and chlorine but aq. solution of NaCl under similar conditions produce hydrogen and chlorine. Explain.
27. In group I analysis a student obtained a precipitate containing both AgCl and PbCl_2 . Suggest one reagent that would allow her to separate AgCl from PbCl_2 .
28. Write the lewis dot structure of CO_3^{2-}