

Roll No.

CODE : S1CH2

KENDRIYA VIDYALAYA SANGATHAN, PATNA REGION
SESSION ENDING EXAMINATION, 2017-18

CLASS - XI

885

CHEMISTRY

Sl. No.

TIME - 3 HOURS]

[MAX. MARKS - 70

General Instructions :

- (i) All questions are compulsory.
 - (ii) There are 26 questions in total.
 - (iii) Questions 1 to 5 are very short answer type questions and carry 1 mark each.
 - (iv) Questions 6 to 10 carry 2 marks each.
 - (v) Questions 11 to 22 carry 2 marks each.
 - (vi) Questions 23 are value based question carrying 4 marks.
 - (vii) Questions 24 to 26 carry 5 marks each.
 - (viii) Use of calculators is not permitted. However, you may use log tables if necessary.
1. Why is Ga smaller in size than Al ? 1
 2. Which isotope of Hydrogen is radioactive ? 1
 3. Write the conjugate acids of NH_3 and HCO_3^- . 1
 4. Write ideal gas equation for 1 mole of gas. 1
 5. Arrange ethyne, ethene and ethane in the order of increasing acidity. 1
 6. Define : 2
 - (a) Standard enthalpy of formation
 - (b) Standard enthalpy of neutralization
 7. Give reason : 2
 - (a) Na_2O_2 is diamagnetic in nature
 - (b) Potassium is more reactive than Sodium

[Turn Over

OR

What happens when

(a) Mg burnt in air ?

(b) Quick lime is heated with Silica ?

8. In Carius method of estimation of halogen 0.30 g of an organic compound gave 0.24g of AgBr. Find out the percentage of Bromine in the compound.

[Molar mass of AgBr = 188g/mol, Atomic mass of Br = 80g/mol] 2

9. Calculate the energy of 1 mole of photons of radiation whose frequency is 5×10^{14} Hz. 2

10. What do you understand by electron deficient and electron rich compounds of Hydrogen ? Provide justification with suitable examples. 2

11. 10 g of Ag reacts with 1g of Sulphur. Calculate the mass of Ag_2S formed. Will any of the two reactants remain unreacted ? If yes which one and what would be its mass ? 3

12. (a) Define Hund's rule. 3

(b) Write the electronic configuration of Cr^{3+} (24)

(c) Define Pauli's exclusion principle.

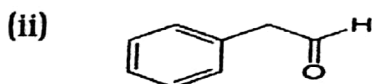
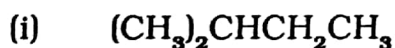
13. Give reason: 3

(a) Why are cations smaller than neutrals atom ?

(b) Fluorine has lower electron gain enthalpy than chlorine.

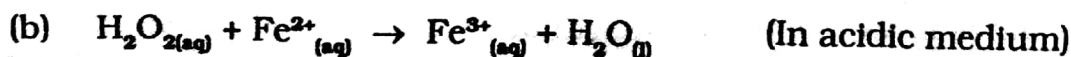
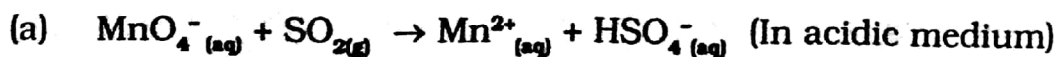
(c) Sulphur has lesser ionization enthalpy than Phosphorus.

14. (a) Write IUPAC name of the following compounds : 3



(b) What is functional isomerism ? Give an example.

15. Balance the following redox reactions by ion-electron method/half reaction method : 3



16. Starting with sodium chloride how would you proceed to prepare : 3
 (i) Sodium Hydroxide (ii) Sodium Carbonate (iii) Sodium Metal
17. Density of a gas is found to be $5.46\text{g}/\text{dm}^3$ at 27°C at 2 bar pressure. What will be its density at STP ? 3
18. Discuss the shape of the following molecule : 3
 (i) BCl_3 (ii) SiCl_4 (iii) PCl_5

OR

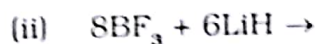
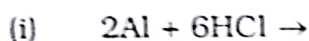
Write the molecular orbital electronic configurations of the following species N_2 , N_2^+ and N_2^- .

- (a) Calculate their bond orders (b) Predict their magnetic behavior
19. Calculate the enthalpy change when 2.38g of CO vaporizes at its normal boiling point, if the enthalpy of vaporization of CO is 6.04 kJ/mol . 3
20. (a) Describe the state of hybridization PCl_5 . Why are axial bonds longer than equatorial bonds ?
 (b) Draw the Lewis structure of H_2SO_4 . 3
21. Calculate the wavelength, frequency, and wave number of light wave whose period is $2.0 \times 10^{-10}\text{s}$. 3
22. Describe with the help of chemical equation any two of the following : 3
 (a) Markovnikov rule (b) Decarboxylation (c) Wurtz reaction
23. American President has discussed with Mr. Modi to save environment by decreasing the use of CFCs : 4
 (a) What values are associated with the decision to decrease the use of CFC ?
 (b) What are CFCs ?
 (c) What is harmful effect of CFC ?
 (d) Give chemical reaction involving harmful effects of CFC ?
24. (a) Convert : 5
 (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

An alkyl halide compound 'A' ($C_5H_{11}Br$) reacts with alcoholic KOH to give Compound 'B', an alkene. 'B' on reaction with bromine gives compound 'C'. 'C' on further Dehydrobromination gives compound 'D'. When one mole of 'D' is treated with sodium metal in liquid ammonia, it gives one mole of sodium salt of 'D' and half a mole of Hydrogen gas. On complete hydrogenation, 'D' gives a straight chain alkane. What are names of A, B, C & D.

25. (a) Complete the equations :



(b) Explain :

(i) Boron is unable to form BF_6^{3-} ion

(ii) $[SiF_6]^{2-}$ is known whereas $[SiCl_6]^{2-}$ is not known

(iii) Conc. HNO_3 can be stored in Aluminum container.

OR

(a) How is diborane prepared in laboratory? Draw its structure.

(b) Explain why CO_2 is a gas while SiO_2 is solid.

(c) What is dry ice? Why is it so called?

(d) Why silicones are water-repellant?

26. (a) What do you understand by following :

5

(i) Dissociation constant of an acid

(ii) Buffer solution

(b) Ionic product of water at 310K is 2.7×10^{-14} , what is the pH of neutral water at this temperature?

OR

(i) 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.

(ii) Define the following terms :

(a) Common ion effect

(b) Le-chatelier's principle

(c) Homogeneous equilibria