**(FOR THE CANDIDATES ADMITTED DURING THE ACADEMIC YEAR 2021-22 ONLY)**

**SUB CODE 21 UCY 304**

**REG.NO.**

**N.G.M.COLLEGE (AUTONOMOUS) : POLLACHI**

**END-OF-SEMESTER EXAMINATIONS : DECEMBER – 2022**

**B.Sc. – CHEMISTRY** **MAXIMUM MARKS: 70**

**III SEMESTER** **TIME : 3 HOURS**

## PART - III

## CORE III INORGANIC AND PHYSICAL CHEMISTRY

**SECTION – A (10 X 1 = 10 MARKS)**

**ANSWER THE FOLLOWING QUESTIONS.**
**MULTIPLE CHOICE QUESTIONS. (K1)**

1. The foreign matter present along with the ore is……..

   a) mineral b) matrix c) slag d) aquamarine

2. Water gas is a mixture of……

   a) $CO+H_2$ b) $C+H_2$ c) $H_2+O_2$ d) $CO+N_2$

3. Which of the following change the value of K……..

   a) adding reactant b) adding product c) changing temperature d) adding a catalyst

4. A real solution is one which…….

   a) obeys Raoult's law b) does not obey Raoult's law

   c) obey Henrys law d) does not obey Henry's law

5. Which of the following is a colligative property ?

   a) Osmotic pressure b) Boiling point c) Surface tension d) Viscosity

**ANSWER THE FOLLOWING IN ONE (OR) TWO SENTENCES. (K2)**

6. What is platinum black?
7. What are lanthanides and actinides?
8. State Le-Chatelier's principle
9. Explain Henry's law
10. Explain the term depression in freezing point

**SECTION – B (5 X 4 = 20 MARKS)**

**ANSWER EITHER (a) OR (b) IN EACH OF THE FOLLOWING QUESTIONS.(K3)**

11. a) Explain Van -Arkel refining with suitable example

**(OR)**

b) Discuss the separation of metals by Calcination and Roasting

12. a) What are fuels? Explain their classifications?

**(OR)**

b) Explain the manufacturing process and uses of the following

i) Urea ii) CAN

13. a) Discuss Van't-Hoff's reaction isotherm

**(OR)**

b) Derive Gibbs-Duhem equation

14. a) Sketch the phase diagram for Nicotine-water system and explain its salient features

**(OR)**

b) Write a brief note of azeotropes

15. a) How will you calculate the molecular weight of a substance by elevation of boiling point?

**(OR)**

b) With a neat diagram, explain depression in freezing point by Beckmann's method

## SECTION - C (4 X 10 = 40 MARKS)

**ANSWER ANY FOUR OUT OF SIX QUESTIONS**
**(16th QUESTION IS COMPULSORY AND ANSWER ANY THREE QUESTIONS. (K4 / K5)**

16. i) Illustrate the relation between Kp and Kc
ii) Discuss De-Donder's concept of chemical equilibrium.

17. i) Outline the process involved in heat treatment of steel
ii) Give the preparation and two uses of $V_2O_5$ .

18. Explain the following terms and discuss their importance
i) Octane number ii) Primary nutrients iii) LPG iv) Cracking of petroleum

19. Derive Duhem-Margules equation. Explain its applications

20. What is Osmotic pressure? How will you determine the osmotic pressure of a dilute solution by Berkely and Hartley method?

21. Give a detailed account of the periodic properties of Fe, Co and Ni

***ETHICAL PAPER***

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