

Roll No. 2017058759

**053/B**

Total No. of Questions : 26 ]

[Total No. of Printed Pages : 4

SS

2037

**ANNUAL EXAMINATION SYSTEM**

**CHEMISTRY (Theory)**

**(Common for Science & Agriculture Groups)**

**(English Version)**

**(Evening Session)**

Time allowed : Three hours

Maximum marks : 70

- Note :**
- (i) You must write the subject code/paper code **053/B** in the box provided on the title page of your answer-book.
  - (ii) Make sure that the answer-book contains 30 pages (including title page) and are properly serialized as soon as you receive it.
  - (iii) Question/s attempted after leaving blank page/s in the answer-book would not be evaluated.
  - (iv) Log tables may be asked for if needed.
  - (v) Use of simple calculator is allowed.
  - (vi) Marks allotted to each question are indicated against it.
  - (vii) The paper comprises of 26 questions. Attempt total 26 questions. Internal choice is given in Q. No. 19, 23, 24, 25 and 26.
  - (viii) Question No. 1 to 8 carry one mark each. Answer in one line.
  - (ix) Question No. 9 to 16 will be of two marks each. All questions are compulsory. They are short answer type questions.
  - (x) Question No. 17 to 23 will be of 4 marks each. All questions are compulsory. Internal choice is given for Q. No. 19 and 23.
  - (xi) Question No. 24, 25 and 26 (Three questions) will be of 6 marks each. All questions are compulsory. Full internal choice is given.

**All questions are compulsory.**

1. Under what conditions the van't Hoff factor is less than one ?

1

**053/B-SS**

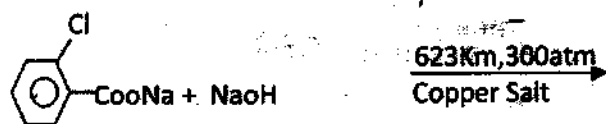
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(2)

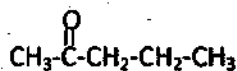
2. Define molecularity of a reaction. 1

3. Write down IUPAC name of  $\begin{matrix} \text{CH}_2\text{-CH}_3 \\ | \\ \text{CH}_3\text{-NH} \end{matrix}$  1

4. Complete the following reaction :- 1



5. Write down the position isomer of 1



6. Write down name of one antiseptic. 1

7. What are artificial sweetners? 1

8. What are polysaccharides? 1

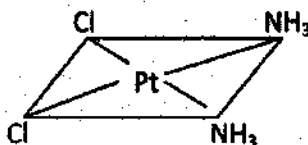
9. The two ions  $\text{A}^+$  and  $\text{B}^-$  have radii 88 pm and 200 pm respectively. In the close packed crystal of compound AB, predict the coordination number of  $\text{A}^+$ . 2

10. A first order reaction is 20% complete in 10 minutes. Calculate the time for 75% completion of the reaction. 2

11. What is Froth flotation process for concentration of ore? 2

12. Write down differences between addition and condensation polymers. 2

13. Express geometrical isomerism in 2



14. What is mutarotation? 2

(3)

15. Write down coupling reaction of amines. 2
16. Explain how the colour of  $K_2Cr_2O_7$  solution depends on  $p_H$  of the solution? 2
17. Unit cell of an element (atomic mass = 108 amu and density =  $10.5 \text{ g cm}^{-3}$ ) has an edge length of 409 pm. Deduce the type of crystal lattice. 4
18. (i) Prove that depression in freezing point is a colligative property. 2  
(ii) 45g of ethylene glycol ( $C_2H_6O_2$ ) is mixed with 600g of water. Calculate the freezing point depression ( $K_f$  for water =  $1.86 \text{ K Kg mol}^{-1}$ ). 2
19. Explain the variation of molar conductivity of strong and weak electrolytes with dilution. 4

or

Write the Nernst equation and calculate the emf of following cell at 298K :- 4



Given  $E^\circ \text{Mg}^{2+}/\text{Mg} = -2.37\text{V}$ ,  $E^\circ \text{Cu}^{2+}/\text{Cu} = 0.34\text{V}$

20. Define coagulation. Differentiate between physical adsorption and chemical adsorption. 4
21. (i) Among noble gases, only Xe is known to form chemical compounds. Why? 2  
(ii) Sulphur is a solid but oxygen is a gas. Why? 2
22. (i) Alcohols have higher boiling point than alkanes. Why? 2  
(ii) Discuss oxidation of primary, secondary and tertiary alcohols. 2
23. (i) Write Cannizzaro reaction. 1  
(ii) Write aldol condensation. 1  
(iii) Why aliphatic carboxylic acids are stronger than phenols? 2
- or
- (i) Carboxylic acids do not give characteristic reactions of carbonyl group. Explain. 2  
(ii) Why do aldehydes and ketones have high dipole moment? 2

(4)

24. (i)  $\text{PbCl}_2$  is known but  $\text{PbCl}_4$  is not known. Explain with inert pair effect. 2  
(ii) Why is  $\text{SF}_6$  much less reactive than  $\text{SF}_4$ ? 2  
(iii) Give hybridization and draw structure of  $\text{XeF}_2$ . 2
- or
- (i) Draw flow chart for Haber's process for the manufacture of ammonia. 3  
(ii) Write down the reaction of Ozone with Potassium nitrite. 2  
(iii) Draw structure of  $\text{IF}_5$ . 1
25. (i) Why do transition elements exhibit higher enthalpies of atomization? 2  
(ii) Calculate equivalent weight of  $\text{KMnO}_4$  in alkaline medium. 2  
(iii) What are the consequences of Lanthanoid contraction? 2
- or
- (i) Write down general electronic configuration and any two uses of block elements. 3  
(ii) Copper is regarded as transition metal though it has completely filled d-orbitals ( $3d^{10}4s^1$ ). Explain. 2  
(iii) Draw the structure of chromate ion. 1
26. Write the following reactions :
- (i) Wurtz reaction 1  
(ii) Sandmeyer's reaction 1  
(iii) Hunsdiecker reaction 1  
(iv) Reimer-Tiemann reaction 1  
(v) Friedel Craft's acylation 1  
(vi) Ullman reaction 1
- or
- (i) Why are haloarenes more stable than haloalkanes? 3  
(ii) Alkyl halides react with  $\text{AgNO}_2$  to give  $\text{R-NO}_2$  or  $\text{R-ONO}$ . Explain. 3