

Roll No. 2017058758

053/A

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/A** 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 serialed 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 greater than one ?

1

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[Turn over

(2)

2. Define order of reaction.

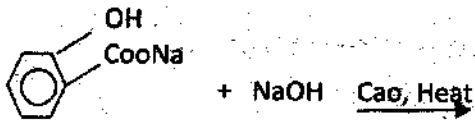
1

3. Write down IUPAC name of $\text{CH}_3\text{-NH-CH}_3$

1

4. Complete the following reaction :-

1



5. Write down an isomer of $\text{C}_2\text{H}_5\text{OH}$.

1

6. What are food preservatives?

1

7. What are antacids?

1

8. What are disaccharides?

1

9. The radius of Na^+ ion is 95 pm and that of Cl^- ion is 181 pm. Predict whether the Co-ordination number of Na^+ ion is 6 or 4.

2

10. A first order reaction is 20% complete in 20 minutes. Calculate the time it will take the reaction to complete 80%.

2

11. What is gravity separation method for concentration of ore?

2

12. Write down differences between terylene fibres and Buna-s rubber (elastomers).

2

13. Express Linkage isomerism in $[\text{Co}(\text{NH}_3)_5\text{NO}_2]\text{Cl}_2$.

2

14. Write down any two differences between nucleoside and nucleotide.

2

15. Write down carbylamine reaction.

2

16. Write down reactions involved in preparation of Potassium dichromate from chromite ore.

2

(3)

17. Determine the type of cubic lattice to which the crystal of the element indicated here belongs. It has an edge length of 290 pm and a density 7.80 g cm^{-3} . Atomic mass of element = 56 amu. 4
18. (i) Prove that osmotic pressure is a colligative property. 2
(ii) Calculate the molar concentration of urea solution if it exerts an osmotic pressure of 2.45 atmosphere at 300K. $[R = 0.0821 \text{ L atm.mol}^{-1} \text{ K}^{-1}]$ 2
19. What is electro chemical theory of rusting of iron and give two methods of prevention of rusting of iron? 4
- or
- Write the Nernst equation and calculate the emf of following cell at 298K :- 4
- $\text{Ni/Ni}^{2+} (0.01\text{M}) \parallel \text{Cu}^{2+} / \text{Cu} (0.01\text{M})$
- Given $E^\circ (\text{Cu}^{2+} / \text{Cu}) = + 0.34\text{V}$, $E^\circ (\text{Ni}^{2+} / \text{Ni}) = -0.22\text{V}$
20. Define Tyndall effect. Differentiate between electrophoresis and electroosmosis. 4
21. (i) Why are interhalogen compounds more reactive than halogens? 2
(ii) All the five bonds in PCl_5 are not equivalent. Justify. 2
22. (i) Phenol has higher boiling point than toluene. Why? 2
(ii) Why alcohols are easily protonated but phenols are not protonated? 2
23. (i) Write Hell-Volhard-Zelinsky reaction. 1
(ii) Write cross aldol condensation. 1
(iii) Ethanoic acid is weaker acid than benzoic acid. Why? 2

(4)

24. (i) Why is H_3PO_3 diprotic in nature? Draw structure. 2
(ii) Why is H_2S less acidic than H_2Te ? 2
(iii) Give hybridization and draw structure of XeF_6 . 2

or

- (i) How is nitric acid manufactured by Ostwald process? 3
(ii) Write down the reaction of Ozone with black lead sulphide. 2
(iii) Draw structure of IF_7 . 1

25. (i) Scandium ($z = 21$) is a transition element but zinc ($z = 30$) is not. Explain. 2
(ii) Calculate equivalent weight of KMnO_4 in acidic medium. 2
(iii) What do you mean by Lanthanoid contraction? 2

or

- (i) Write down any three differences between Lanthanoids and Actinoids. 3
(ii) The melting and boiling points of Zn, Cd and Hg are low. Why? 2
(iii) Draw the structure of manganate ion. 1

26. Write the following reactions :

- (i) Williamson's synthesis 1
(ii) Mendius reaction 1
(iii) Friedel Craft's Alkylation 1
(iv) Haloform reaction 1
(v) Carbylamine reaction 1
(vi) Gattermann reaction 1

or

- (i) Hydrogen atom of chloroform is acidic. Explain. 3
(ii) Why is dehydrohalogenation reaction in haloalkanes termed as Beta-elimination reaction? 3