

Roll No.

053/C

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

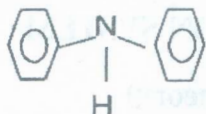
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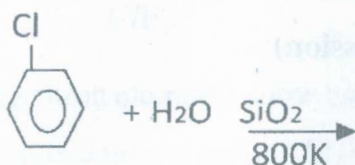
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(2)

2. Define half life period of a reaction. 1
3. Write down IUPAC name of 1



4. Complete the following reaction :- 1



5. Write down the chain Isomer of $\text{CH}_3 - \text{CH}_2 - \text{CH}_2 - \text{CH}_3$ 1
6. Write down name of one antibiotic. 1
7. What are analgesics ? 1
8. What are monosaccharides ? 1
9. A solid has NaCl structure. If the radius of cation A is 100 pm, what is the radius of anion B ? 2
10. Calculate the time required for the completion of 90% of a reaction of first order kinetics
 $t_{1/2} = 44.1$ minutes. 2
11. What is magnetic separation method for concentration of ore ? 2
12. Write down differences between thermosetting polymers and thermoplastic polymers. 2
13. Express coordination isomerism in $[\text{CO}(\text{NH}_3)_6][\text{Cr}(\text{CN})_6]$ 2
14. What do you mean by inversion of cane sugar ? 2
15. Write down Hinsberg's test for primary amines. 2
16. Write down reaction involved in preparation of potassium permanganate from pyrolusite ore. 2

(3)

17. The density of chromium metal is 7.2 g cm^{-3} . If the unit cell is cubic with an edge length of 289 pm, determine the type of unit cell. (Atomic mass of chromium = 529 amu) 4
18. (i) Prove that elevation in boiling point is a colligative property.
 (ii) The boiling point of benzene is 353.23K. When 1.80g of a non-volatile solute was dissolved in 90 g of benzene, the boiling point is raised to 354.11K. Calculate the molar mass of solute. (K_b for benzene = $2.53 \text{ K kg mol}^{-1}$). 2+2
19. What is corrosion ? What are the factors affecting corrosion ? 4
 or
 Write the Nernst equation and calculate the emf of following cell at 298K :- 4
 $\text{Cu(s)}/\text{Cu}^{2+} (0.130\text{M}) \parallel \text{Ag}^+ (1.0 \times 10^{-4}\text{M}) / \text{Ag(s)}$
 Given $E^\circ (\text{Cu}^{2+} / \text{Cu}) = +0.34\text{V}$
 $E^\circ (\text{Ag}^+ / \text{Ag}) = +0.80\text{V}$
20. Define colloidal solution. Differentiate between lyophilic colloids and lyophobic colloids. 4
21. (i) SO_2 act as both oxidising and reducing agent but H_2S acts as only reducing agent. Why ? 2
 (ii) Why halogens are coloured ? 2
22. (i) Why do ethers possess dipole moment ? 2
 (ii) Boiling points of ethers are lower than their corresponding isomeric alcohols. Why ? 2
23. (i) Write Clemmensen reduction reaction. 1
 (ii) Write Rosenmund reaction. 1
 (iii) Formaldehyde gives Cannizzaro reaction whereas acetaldehyde does not. Why ? 2
 or
 (i) Aldehydes and ketones undergo a number of nucleophilic addition reactions. Why ? 2
 (ii) Acetic acid is liquid while aromatic acids are solids. Give reasons. 2

(4)

24. (i) Unlike Phosphorus, nitrogen shows little tendency for catenation. Why? 2
 (ii) SF_6 is known but SH_6 is not known. Explain. 2
 (iii) Give hybridization and draw structure of XeF_4 . 2

or

- (i) Explain the steps involved in manufacture of sulphuric acid by contact process. 3
 (ii) Write down the reaction of Ozone with Potassium iodide. 2
 (iii) Draw structure of ClF_3 . 1

25. (i) Why do transition elements show catalytic properties? 2
 (ii) Calculate equivalent weight of KMnO_4 in neutral medium. 2
 (iii) What is the cause of Lanthanoid contraction? 2

or

- (i) Write down any three similarities between lanthanoids and actinoids. 3
 (ii) Out of Co^{2+} and Zn^{2+} which will be paramagnetic and why? 2
 (iii) Draw the structure of permanganate ion. 1

26. Write the following reactions :

- (i) Balz-Schiemann reaction 1
 (ii) Fittig's reaction 1
 (iii) Gattermann reaction 1
 (iv) Finkelstein reaction 1
 (v) Diazotisation reaction 1
 (vi) Grooves process. 1

or

- (i) The treatment of alkylhalide with aqueous KOH leads to the formation of alcohols while in the presence of alcoholic KOH, alkenes are formed as the major product. Explain. 3
 (ii) How aryl halides react with sodium metal? Explain why alkyl halides show nucleophilic substitution reaction? 3

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