Roll No. 2017058745

Total No. of Questions : 26]

053/C

[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/C** *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.

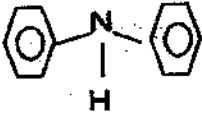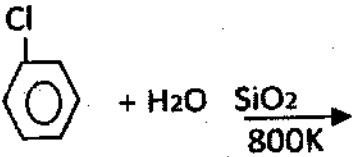1. Under what conditions the van't Hoff factor is equal to one ?

1

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[Turn over

(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 $CH_3 - CH_2 - CH_2 - CH_3$ 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
    $t \frac{1}{2} = 44.1$ 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 $[CO(NH_3)_6][Cr(CN)_6]$ 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

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(3)

17. The density of chromium metal is 7.2g 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 = 2.53K Kgmol⁻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

$Cu(s)/Cu^{2+}$ (0.130M) $\parallel Ag^+$ (1.0×10⁻⁴M) / Ag(s)

Given E° (Cu^{2+} / Cu) = + 0.34V

E° (Ag^+ / Ag) = + 0.80V

20. Define colloidal solution. Differentiate between lyophillic 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

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(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

<div align="center">or</div>

  (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

<div align="center">or</div>

  (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

<div align="center">or</div>

  (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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