Roll No. 2017 058759

Total No. of Questions : 26]

053/B

[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 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.

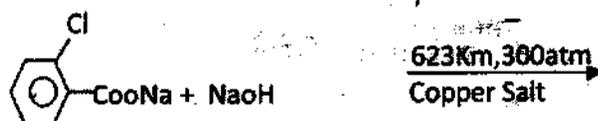1. Under what conditions the van't Hoff factor is less than one ?   1
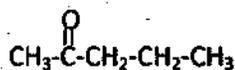
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[Turn over

(2)

2. Define molecularity of a reaction. 1

3. Write down IUPAC name of $CH_3-NH-CH_2-CH_3$ 1

4. Complete the following reaction :—

$$\text{(Cl—C}_6\text{H}_4\text{—CooNa)} + \text{NaoH} \xrightarrow[\text{Copper Salt}]{623Km, 300atm}$$

1

5. Write down the position isomer of 1

$$CH_3-\overset{O}{\overset{\|}{C}}-CH_2-CH_2-CH_3$$

6. Write down name of one antiseptic. 1

7. What are artificial sweetners ? 1

8. What are polysaccharides ? 1

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

$$\begin{array}{ccc} Cl & & NH_3 \\ & Pt & \\ Cl & & NH_3 \end{array}$$
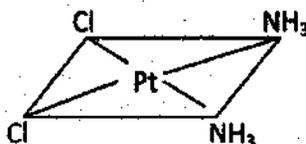
14. What is mutarotation ? 2

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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 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 K Kg mol^{-1}).   2

19. Explain the variation of molar conductivity of strong and weak electrolytes with dilution.   4

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

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

Mg(s)/Mg^{2+} (0.001M) ‖ Cu^{2+} (0.0001M) / Cu(s)

Given E^o Mg^{2+} / Mg = –2.37V, E^oCu^{2+}/ Cu = 0.34V

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

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

   (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) $PbCl_2$ is known but $PbCl_4$ is not known. Explain with inert pair effect.   2

(ii) Why is SF_6 much less reactive than SF_4 ?   2

(iii) Give hybridization and draw structure of 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 IF_5.   1

25. (i) Why do transition elements exhibit higher enthalpies of atomization ?   2

(ii) Calculate equivalent weight of $KMnO_4$ 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 $AgNO_2$ to give $R-NO_2$ or $R-ONO$. Explain.   3

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