Series–A

Roll No .....

Total No. of Questions-29] [Total No. of Printed Pages-15

A–855–A–XII–2324

CHEMISTRY

(Theory)

Time Allowed—3 Hours Maximum Marks—60

Candidates are required to give their answers in their own words as far as practicable.

Marks allotted to each question are indicated against it.

Special Instructions :

(i) **You must write Question Paper Series in the circle at top left side of title page of your Answer-book.**

(ii) While answering your Questions, you must indicate on your Answer-book the same Question No. as appears in your Question Paper.

(iii) Do not leave blank page/pages in your Answer-book.

(iv) All questions are compulsory. Answer all parts of a question together.

(v) Internal choices are given in some questions.

(vi) Answers should be brief and to the point.

(vii) Question Nos. 1 to 12 are MCQ (Multiple Choice Questions) carrying 1 mark each. Question Nos. 13 to 21 are short answer type questions carrying 2 marks each. Question Nos. 22 to 26 carrying 3 marks each. Question Nos. 27 to 29 carrying 5 marks each.

1. Which of the following is used as both Analgesics and Antipyretic ?

(a) Aspirin

(b) Penicillin

(c) Morphine

(d) Seldane. 1

2. What is the IUPAC name of isoprene monomer of natural rubber?

(a) 3-Methyl-1, 2-butadiene

(b) 2-Methyl-1, 3-butadiene

(c) 1, 3-Butadiene

(d) 3-Methylbutadiene. 1

3 Which of the following bases is not present in DNA ?

(a) Adenine

(b) Uracil

(c) Guanine

(d) Cytosine 1

4. What will be the product of following reaction :

$$R-COONa \xrightarrow[\text{Heat}]{NaOH + CaO} ? + Na_2CO_3$$

(a) $R–CH_2OH$

(b) R CHO

(c) $R–CH_3$

(d) R–H.

5. Arrange the following compounds in increasing order of their acid strength 1

(i) 2,4,6-trinitrophenol

(ii) 3-nitrophenol

(iii) 3,5-dinitrophenol

(iv) 4-Methylphenol.

(a) (i), (ii), (iii), (iv)

(b) (iv), (ii), (iii), (i)

(c) (iii), (iv), (ii), (i)

(d) (ii), (i), (iii), (iv)

6. The Silver UK coins are an alloy of Copper with :

(a) Silver

(b) Aluminium

(c) Nickel

(d) Chromium.

7. The first ionisation enthalpy of Xenon is almost identical with that of :

(a) Molecular oxygen

(b) Molecular Nitrogen

(c) Molecular Fluorine

(d) Molecular Hydrogen.

8. The Units of reaction rate constant are mol $L^{-1}s^{-1}$, what is the order of this reaction?

(a) 2

(b) 0

(c) 1

(d) 4. 1

9. Anode in an Electrochemical cell is that electrode on which the following is essential?

(a) +ve charge

(b) –ve charge

(c) oxidation occurs

(d) reduction occurs. 1

10. Which of the following is the best method express concentration of solution?

(a) Molality

(b) Molarity

(c) Normality

(d) Strength.

11. What percentage of a body centred cu structure is vacant?

(a) 68%

(b) 52.4%

(c) 74%

(d) 32%.

12. Which of the following has equal number of Electrons with Chromium?

(a) Fe^{2+}

(b) Fe^{3+}

(c) Cu^{+}

(d) Zu^{2+}. 1

13. Write at least four differences between Schottky and Frenkel defect with examples. 2

14. Represent the cell in which following reaction takes place

$$Mg(s) + 2Ag^{+}(0.0001M) \rightarrow Mg^{2+}(0.130M) + 2Ag(s)$$

Calculate its $E_{(cell)}$ if $E^{\circ}_{(cell)} = 3.17V$. 2

15. Explain the following terms : 2

(i) Tyndall effect

(ii) Electrodialysis.

16. Explain construction and working of a lead storage battery. 2

17. A first order reaction is found to have a rate constant, $K = 5.5 \times 10^{-14}s^{-1}$. Find the half life of the reaction. 2

18. What is Ellingham diagram? What are its applications in metallurgy? 2

19. On the basis of VBT explain why is $[Cr(NH_3)_6]^{3+}$ paramagnetic while $[Ni(CN)_4]^{2-}$ diamagnetic? 2

20. Why are haloarenes less reactive towards nucleophilic substitution reactions? 2

21. What are Synthetic detergents? Describe their different types. 2

22. (a) Boiling point of water at 750 mm Hg is 99.63°C. How much sucrose (molar mass 342 g mol^{-1}) is to be added to 500g water such that it boils at 100°C ? K_b for water = 0.52 K Kg mol^{-1}. 2

(b) What is Van't Hoff factor? 1

Or

(a) What is Froth flotation process? Explain. 2

(b) Define Activation Energy. 1

23. (a) What is Tincture of iodine? 1

(b) What is the purpose of Vulcanisation of rubber? 1

(c) What is the IUPAC name of monomer unit of Polyacrylonitrile ? 1

24. (a) Write the important structural and functional differences between DNA and RNA. 2

(b) What is Carbyl amine reaction? 1

25. (a) How will you convert Butan-1-ol into Butanoic acid? Give chemical reaction. 1

(b) Why is Boiling point of Ketones less than alcohols of similar molecular masses? 1

(c) What is Reimer-Tiemann reaction? 1

26. (a) What is IUPAC name of $K_3[Cr(C_2O_4)_3]$? 1

(b) What are Coinage metals? Write their names. 1

(c) Draw the structure of dichromate $Cr_2O_7^{2-}$ ion. 1

27. (a) Why are melting points of Transition metals very high? 1

(b) Why is Helium used in diving apparatus? 1

(c) Why are interhalogen compounds more reactive than parent halogens ? 1

(d) What is Aqua regia? 1

(e) What happens when SO_3 is passed through water? Give Chemical reaction. 1

Or

(a) Explain in detail 'Ostwald Process'.

(b) Draw the structure of H_3PO_2.

(c) Why Oxygen exists as O_2, whereas sulphur as S_8 ?

28. (a) Explain the structure of XeO_3.

(b) What is Hardy-Schulze rule?

(c) Nitrogen does not form pentahalides why?

(d) What do you mean by Tyndall effect? 1

(e) Complete the reaction :

$$R - OH + ? \rightarrow R - Cl + SO_2 + HCl.$$ 1

29. (a) What is Wurtz Reaction? 1

(b) State Faraday's first law of Electrolysis. 1

(c) Write IUPAC name of  1

(d) Why is ethyl amine more basic than ammonia? 1

(e) What is Hell Volhard-Zelinsky reaction? 1