

# 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.

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(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.

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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

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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 :



- (a) R-CH<sub>2</sub>OH
- (b) R CHO
- (c) R-CH<sub>3</sub>
- (d) R-H.

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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. 1

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. 1

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8. The Units of reaction rate constant are  $\text{mol L}^{-1}\text{s}^{-1}$ , 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

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

(a) Molality

(b) Molarity

(c) Normality

(d) Strength.

1

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

(a) 68%

(b) 52.4%

(c) 74%

(d) 32%.

1

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

(a)  $\text{Fe}^{2+}$

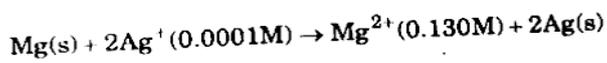
(b)  $\text{Fe}^{3+}$

(c)  $\text{Cu}^+$

(d)  $\text{Zn}^{2+}$ . 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



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

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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,  $K = 5.5 \times 10^{-14}\text{s}^{-1}$ . 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  $[\text{Cr}(\text{NH}_3)_6]^{3+}$  paramagnetic while  $[\text{Ni}(\text{CN})_4]^{2-}$  diamagnetic? 2

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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  $99.63^{\circ}\text{C}$ . How much sucrose (molar mass  $342\text{ g mol}^{-1}$ ) is to be added to 500g water such that it boils at  $100^{\circ}\text{C}$ ?  $K_b$  for water =  $0.52\text{ K Kg mol}^{-1}$ . 2
- (b) What is Van't Hoff factor? 1

**Or**

- (a) What is Froth flotation process? Explain. 2
- (b) Define Activation Energy. 1

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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

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Or

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? <https://www.hpboardonline.com> 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

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- (a) Explain in detail 'Ostwald Process'. 3
- (b) Draw the structure of  $H_3PO_2$ . 1
- (c) Why Oxygen exists as  $O_2$ , whereas sulphur as  $S_8$  ? 1
28. (a) Explain the structure of  $XeO_3$ . 1
- (b) What is Hardy-Schulze rule? 1
- (c) Nitrogen does not form pentahalides, why? 1
- (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

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- (b) State Faraday's first law of Electrolysis. 1
- (c) Write IUPAC name of  $\text{H}-\overset{\text{O}}{\parallel}{\text{C}}-\text{H}$ . 1
- (d) Why is ethyl amine more basic than ammonia? 1
- (e) What is Hell Volhard-Zelinsky reaction? 1

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