

Roll No. ....

053

Total No. of Questions : 26]

[Total No. of Printed Pages : 4

SS

2117

ANNUAL EXAMINATION SYSTEM

CHEMISTRY (Theory)

(Common for Science and Agriculture Groups)

(English Version)

Time allowed : Three hours

Maximum marks : 70

*Note : (i) You must write the subject-code/paper-code 053 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 serialised 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.*

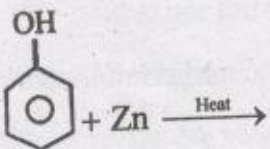
*(ix) Question No. 9 to 16 will be of two marks each. All questions are compulsory. They are short answer type questions.*

*(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. Define normality of a solution. 1
2. Define activation energy of a reaction. 1
3. What type of drug is penicillin? 1

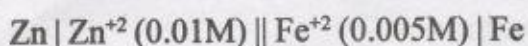
4. What are antiseptics ? 1
5. Mention one important function of carbohydrates in our body. 1
6. Write down Cannizzaro's reaction. 1
7. Complete the following reaction : 1
- 
8. Convert aniline to benzonitrile. 1
9. Atoms of element B form hcp lattice and those of the element A occupy two third (2/3) of the tetrahedral voids. What is the formula of the compound formed by these elements A and B ? 2
10. The rate law for a reaction of A, B and C has been found to be  $\text{rate} = k [A] [B] [C]^2$ . How would the rate of reaction change when concentration of A is halved ? 2
11. Write down the names of any two ores of copper. 2
12. Write down the name of monomers and one use of Teflon. 2
13. (i) Define co-ordination number. 1
- (ii) Write down IUPAC name of  $\text{Na}_3 [\text{Co}(\text{NO}_2)_6]$  1
14. Write down one main source and one deficiency disease of Vitamin B<sub>1</sub>. 1+1=2
15. Why is methylamine stronger base than ammonia ? 2
16. Why are  $\text{Mn}^{+2}$  compounds more stable than  $\text{Fe}^{+2}$  compounds towards oxidation to their +3 state? 2
17. Lead (II) sulphide crystal has NaCl structure. What is its density ? The edge length of the unit cell of PbS crystal is 500 pm. (Atomic masses : Pb = 207, S = 32). 4
18. (i) State Henry's Law. 2
- (ii) 18 g of glucose ( $\text{C}_6\text{H}_{12}\text{O}_6$ ) is dissolved in 1000g of water. Calculate elevation in boiling point.  $K_b$  for water is  $0.52 \text{ K Kg mol}^{-1}$ . 2

( 3 )

19. (i) Write any two differences between electrochemical cell and electrolytic cell. 2  
(ii) Define resistivity and give its S.I. units. 1+1=2

or

Write down the Nernst equation and calculate e.m.f. of the following cell at 25°C :



$$\text{given : } E^\circ_{(\text{Zn}^{+2}|\text{Zn})} = -0.763\text{V}$$

$$E^\circ_{(\text{Fe}^{+2}|\text{Fe})} = -0.44\text{V} \quad 4$$

20. Explain briefly the activity and selectivity of a catalyst. 2+2=4
21. (i) How will ozone oxidise lead sulphide ? 2  
(ii) Why is H<sub>2</sub>O a liquid and H<sub>2</sub>S a gas ? 2
22. (i) Explain Victor Meyer's test for primary (1°) alcohols. 2  
(ii) Alcohols are soluble in water while alkyl halides are not, although both are polar compounds. Explain. 2
23. (i) Give one test to distinguish between phenol and benzoic acid. 2  
(ii) Write down the reaction between acetic acid and ethyl alcohol in presence of conc. H<sub>2</sub>SO<sub>4</sub>. 2

or

- (i) Why do aldehydes and ketones have high dipole moments ? 2  
(ii) How will you convert acetic acid to trichloroacetic acid ? 2
24. (i) H<sub>3</sub>PO<sub>4</sub> is triprotic acid explain. 2  
(ii) SO<sub>3</sub> has zero dipole moment. Why ? 2  
(iii) Why do noble gases form compounds with fluorine and oxygen ? 2

or

- (i) Draw diagram in manufacture of sulphuric acid by contact process. 3  
(ii) Why are halogens strong oxidising agents ? 2  
(iii) Draw structure of thiosulphuric acid (H<sub>2</sub>S<sub>2</sub>O<sub>3</sub>). 1

(4)

25. (i) Explain why  $\text{ScCl}_3$  is colourless while  $\text{TiCl}_3$  is coloured? 2  
(ii) Why do transition metals show catalytic properties? 2  
(iii) Which of  $\text{Lu}(\text{OH})_3$  and  $\text{La}(\text{OH})_3$  is more basic and why? 2

or

- (i) What are the consequences of Lanthanoid contraction? 3  
(ii) Chromium is a typical hard metal where as mercury is a liquid. Why? 2  
(iii) Draw the structure of chromate ion: 1

26. Write down the following reactions :

- (i) Haloform reaction 1  
(ii) Sandmeyer's reaction 1  
(iii) Wurtz reaction 1  
(iv) Balz-Schiemann reaction 1  
(v) Carbylamine reaction 1  
(vi) Groove's process. 1

or

- (i) Explain the mechanism of  $\text{S}_{\text{N}}1$  reactions of alkyl halides. 3  
(ii) The para isomer of dichlorobenzene has higher melting point than ortho and meta isomer why? 3