

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.

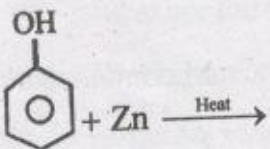
(ix) Question No. 9 to 16 will be of two marks each. All questions are compulsory. They are short answer type questions.

(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
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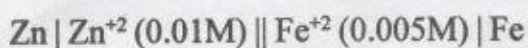
$$\text{C}_6\text{H}_5\text{OH} + \text{Zn} \xrightarrow{\text{Heat}}$$
8. Convert aniline to benzonitrile. 1
9. Atoms of element B form hcp lattice and those of the element A occupy two third (2/3) of the tetrahedral voids. What is the formula of the compound formed by these elements A and B ? 2
10. The rate law for a reaction of A, B and C has been found to be $\text{rate} = k [\text{A}] [\text{B}] [\text{C}]^2$. 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 B₁. 1+1=2
15. Why is methylamine stronger base than ammonia ? 2
16. Why are Mn^{+2} compounds more stable than 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 :



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_2O a liquid and H_2S 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_2SO_4 . 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_3PO_4 is triprotic acid explain. 2
(ii) SO_3 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 ($\text{H}_2\text{S}_2\text{O}_3$). 1

(4)

25. (i) Explain why ScCl_3 is colourless while 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