First Year B.Sc. Degree Examination, August/September 2008 Directorate of Correspondence Course (Freshers)

Paper - 1: CHEMISTRY

Time: 3 Hours

Max. Marks: 85

Note: 1) This paper consists of four Sections. Answer all Sections.

2) Write equations and neat diagrams wherever necessary.

SECTION - A

I. Answer in a word, a phrase or a sentence:

 $(10 \times 1 = 10)$

- 1) Define uncertainty principle.
- 2) How is a carbocation formed?
- 3) What is zeta potential?
- 4) Define calorific value.
- 5) What is a functional group
- 6) What is plasmolysis?

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- 7) Define hybridisation,
- 8) Define critical temperature.
- 9) What is a sigma bond?
- 10) What is electron affinity?

SECTION - B

II. Answer any FIVE of the following:

 $(5 \times 3 = 15)$

- 11) Define ionisation energy. Discuss its variation down the group and along the period.
- 12) Give the mechanism of SN² reaction.
- 13) Explain the degree of freedom of motion.

- 14) What are the constituents of paint? Give their functions.
- 15) Describe the stability of cycloalkanes by Baeyer's strain theory.
- 16) Discuss diagonal relationship between Lithium and Magnesium.
- 17) Define Frendlich adsorption isotherm. Mention its limitations.

SECTION - C

. Ans	we	er any FIVE of the following:	5×6=30)
18)	a)	Compare the size of anion and cation with the size of atom.	3
	b)	Explain the factors influencing Application energy.	3
19)	a)	Describe Carius method of estimation of halogen.	4
	b)	How is butane prepared by Wurtz reaction?	2
20)	a)	What is critical solution temperature? Discuss critical solution temper in Nicotine-water system.	ature 4
	b)	Calculate osmotic pressure of a 5% solution of glucose (mol wt = 1) at 18°C.	80) 2
21)	a)	Describe the manufacture of water gas.	4
	b)	What are propellants? Give an example.	2
22)	a)	Give the mechanism of addition of HBr to propene in pressance of a pero	oxide. 4
	b)	$CH_3CH_2Br + ? \xrightarrow{\Delta} CH_2 = CH_2$	
		Mention the reagent used above and name the reaction.	2
23)	a)	Calculate critical constants in terms of Vander waals constants using Vander waals equation.	4
n	b)	Vander waals constants for HCl gas are $a = 3.67$ atm lit ⁻² and $b = 40.8$ ml find the critical pressure of the gas.	mol,
24)	a)	What are the advantages of gaseous fuel over solid and liquid fuels '	? 3
		What are ortho and para hydrogen? Give any two differences between	
	18) 19) 20) 21) 22)	18) a) b) 19) a) b) 20) a) b) 21) a) b) 22) a) b) 23) a) b)	 18) a) Compare the size of anion and cation with the size of atom. b) Explain the factors influencing ionisation energy. 19) a) Describe Carius method of estimation of halogen. b) How is butane prepared by Wurtz reaction? 20) a) What is critical solution temperature? Discuss critical solution temper in Nicotine-water system. b) Calculate osmotic pressure of a 5% solution of glucose (mol wt = 1 at 18°C. 21) a) Describe the manufacture of water gas. b) What are propellants? Give an example. 22) a) Give the mechanism of addition of HBr to propene in pressance of a percent of the property of the mechanism of addition of HBr to propene in pressance of a percent of the property of



SECTION - D

IV. Answer any THREE of the following:	(3×10=30)
25) a) Write Schrodinger wave equation. Draw the shapes of S and P or	
b) Describe an experiment to determine the charge on the colloids.	3
c) 0.1435 g of an organic compound containing C, H and O on congave 0.3235 g of CO ₂ and 0.1339 g of H ₂ O. Calculate the percentarbon hydrogen and oxygen.	nbustion ntage of 4
26) a) What is an electrophile? Give the mechanism of nitration of benz	ene. 4
b) Discuss the manufacture of cement by dry process.	4
c) Define gold number. Mention two applications of colloids.	2
27) a) Describe the manufacture of glass by tank furnace method.	4
b) How is molar mass of a non-volatile solute determined by Walker-Li method?	umsden 4
c) Calculate the root mean square velocity of oxygen molecules at 3	00 K. 2
28) a) What are quantum numbers? Explain their significance.	4
b) How is critical temp and critical pressure determined?	4
c) Calculate the most probable velocity of CO2 at STP.	2