

		Sanjay Ghodawat University, Kolhapur		2019-20
Established as State Private University under Govt. of Maharashtra. Act No XL, 2017				
Year and Program: 2019-20/ S.Y. B. Sc.		School of Science		Department of Chemistry
Course Code: CHS 202		Chemistry-IV		Semester – Even (IV)
Day and Date: <i>Wednesday</i> <i>8/1/20</i>		End Semester Examination		Time: $\frac{1}{2}$ hrs, Max Marks: 100 <i>2.30 - 3.00 pm</i>
PRN:		Seat No:		Section A Marks out of 20:
Signature of student		Signature of Jr Supervisor:		

Section A

Instructions:

- 1) All Questions are compulsory.
- 2) For MCQs mark tic (\checkmark) for correct answer. No marks for multiple tics (\surd).
- 3) Section A should be submitted to Jr. Supervisor immediately after first 30 min.

Q.1 Choose the correct alternative for following	Marks	Bloom's level	C
	20	level	0
1 Which of the following is not a transition element a) Fe b) Mn c) Na d) Cu	1	1	1
2 Most common oxidation state in lanthanides is a) +2 b) +3 c) +4 d) +5	1	1	1
3 What is maximum oxidation state shown by Mn? a) +7 b) +6 c) +4 d) +5	1	1	1
4 Ligand can also be considered as a) Lewis acid b) Bronsted acid c) Bronsted base d) Lewis base	1	2	2
5 IUPAC name of coordination compound $K_3[Fe(CN)_6]$ is a) Potassium hexacyanoferrate (II) b) Potassium hexacyanoferrate (III) c) Potassium hexacynoiron (II)	1	2	2

- d) Potassium hexacyanoiron (III)
- 6 According to CFT which of the following is not strong field ligand 1 2 2
- CN^-
 - NH_3
 - Cl^-
 - CO
- 7 Viscosity of liquids is determined by 1 1 3
- Ostwald's viscometer
 - Stalagmometer
 - drop-pipette
 - Tensiometer
- 8 The equation of state, $PV = RT$ with usual notation is an equation of ----. 1 2 3
- Boyle's Law
 - Charle's Law
 - Graham Law
 - Gay Lussac
- 9 Distance travelled by the gas molecule in two successive collision is known as ----. 1 2 3
- Moat probable velocity
 - mean free path
 - collision diameter
 - mean velocity
- 10 Unit of surface tension of liquid is -----. 1 3 3
- Dyne per cm
 - Dyne. Cm
 - Newton. Meter
 - Poise
- 11 Van der waal's excluded volume per mole i.e. volume correction is denoted by which of the following letter? 1 2 3
- a
 - b
 - c
 - d
- 12 According to the Kinetic theory of gas, the kinetic energy is directly proportional to ---. 1 2 3
- Temperature
 - Pressure
 - volume
 - density
- 13 The unit of viscosity of liquid is -----. 1 2 3
- Dyne per cm
 - Dyne. Cm
 - Newton. Meter
 - Poise

- | | | | | |
|----|---|---|---|---|
| 14 | Solids which exhibit regularity in the arrangement of structural units are called as..... | 1 | 1 | 4 |
| | a) Amorphous | | | |
| | b) Crystalline | | | |
| | c) Liquid crystals | | | |
| | d) Regular solids | | | |
| 15 |are the reciprocal of Weiss indices. | 1 | 3 | 4 |
| | a) Miller indices | | | |
| | b) Bond angles | | | |
| | c) Bond lengths | | | |
| | d) None of these | | | |
| 16 | $n\lambda = 2d\sin\theta$ is known asequation. | 1 | 2 | 4 |
| | a) Avogadro's | | | |
| | b) Nernst's | | | |
| | c) Bragg's | | | |
| | d) Wave | | | |
| 17 | Number of molecules per unit cell in Face Centered Cubic crystal are ----. | 1 | 2 | 4 |
| | a) 1 | | | |
| | b) 2 | | | |
| | c) 3 | | | |
| | d) 4 | | | |
| 18 | If the crystal shows its original appearance two times to the observe during one complete rotation about an axis, then it is -- --. | 1 | 2 | 4 |
| | a) one fold axis of symmetry | | | |
| | b) two fold axis of symmetry | | | |
| | c) threefold axis of symmetry | | | |
| | d) four fold axis of symmetry | | | |
| 19 | The law which governs rate of chemical reaction is ---. | 1 | 2 | 4 |
| | a) Kohlrausch law | | | |
| | b) Boltzmann law | | | |
| | c) law of mass action | | | |
| | d) Debye-Huckel limiting law | | | |
| 20 | The molecularity of following chemical reaction is ----. | 1 | 2 | 4 |
| | $aA + bB = \text{Product}$ | | | |
| | a) $a + b$ | | | |
| | b) $a - b$ | | | |
| | c) $a \div b$ | | | |
| | d) $b \div a$ | | | |

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Year and Program: 2018-19/ S.Y. B. Sc.	School of Science	Department of Chemistry	
Course Code: CHS 202	Chemistry-IV	Semester –Even (IV)	
Day and Date: <i>Wednesday 8/11/20</i>	End Semester Examination	Time: hrs, Max Marks: 100 <i>3.00 pm to 5.30 pm</i>	
PRN:	Seat No:	Section B Marks out of 80:	

Section B

		Marks	Bloom's level	CO
Q.2	Answer the following questions (Solve any Two)	12		
a)	Discuss the electronic configuration of 3d transition elements.	6	2	1
b)	Explain complex compound forming ability of 3d transition elements.	6	1	1
c)	Answer the following 1. Lutetium does not show oxidation state other than +3. Justify. 2. Explain the position of lanthanides in periodic table.	6	2	1
Q.3	Answer the following questions (Solve any Two)	12		
a)	What is Valence Bond Theory? Give its postulates and Limitations.	6	1	2
b)	Give the postulates of Crystal Field Theory and explain with example.	6	3	2
c)	Write note on Jahn-Teller distortion.	6	4	2
Q.4	Answer the following questions (Solve any Two)	12		
i)	State the postulates of Kinetic Theory of Gases and derive kinetic gas equation.	6	3	3
ii)	Discuss how do the real gases deviate from the ideal behavior? What are the causes of deviation?	6	2	3
iii)	Describe how coefficient of viscosity is determined by Ostwald's viscometer?	6	2	3
b)	Write Note on following (any four)	16		
i)	Applications of van der Waal's equation	4	2	3
ii)	Mean free path and collision diameter	4	2	3
iii)	Critical phenomenon	4	3	3
iv)	Continuity of states	4	3	3

	v)	Drop number method of determination of Surface tension	4	2	3
Q.5	a)	Answer the following questions (Solve any Two)	16		
	i)	What is a) Plane of Symmetry b) Axis of symmetry c) Center of symmetry of a crystal? Illustrate with diagram.	8	2	4
	ii)	State Brag's condition and derive the Brag's equation.	8	2	4
	iii)	Derive rate equation for first order reaction.	8	3	4
	b)	Answer the following questions (Solve any Four)	12		
	i)	Write note on Pseudo unimolecular reactions	4	2	4
	ii)	State and explain the Law of constancy of interfacial angles.	4	3	4
	iii)	Explain the Activated complex theory of reaction rate.	4	2	4
	iv)	Explain the terms Order and Molecularity of reaction.	4	2	4
	v)	Show that half time of first order reaction is independent of initial concentration of reactant.	4	1	4