

	Sanjay Ghodawat University, Kolhapur		2018-19
Established as State Private University under Govt. of Maharashtra. Act No XL, 2017			
Year and Program: 2018-2019, M.Sc-I	School of Science	Department of Chemistry	
Course Code: CHS-503	Course Title: Inorganic Chemistry-I	Semester – Odd (I)	
Day and Date: Monday, 3 rd June 2019	End Semester Examination	Time: 3 hrs, Max Marks: 100 10.30 am to 11.00 am	
PRN:	Seat No:	Section A Marks out of 20:	
Jr. Supervisor Sign		Sr. Supervisor Sign	

Section A

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

Q.1 Multiple choice questions.

	Marks	level	CO
	20		
1 XeF ₂ molecule is		L1	1
a) Linear b) Triangular planar c) Pyramidal d) Square planar			
2 The Shape of the IF ₇ molecule is		L1	1
a) Linear b) Triangular c) Pentagonal bipyramidal d) Hexagonal			
3 Bond order of O ₂ , O ₂ ⁻ and O ₂ ²⁻ is		L1	1
a) 2, 2.5 and 3 b) 2, 1.5 and 1 c) 1, 1.5 and 2 d) 2.5, 2 and 1.5			
4 Mathematical expression of Stephan-Boltzmann law is.....		L2	2
a) σT^4 b) $\sigma T^{2/3}$ c) $\sigma T^{4\pi/3}$ d) $\sigma T - \sigma T^{2/3}$			
5 de-Broglie proposed		L1	2
a) Dual nature of wave and particle character of a photon b) Only particle nature of the photon c) Wave and particle has no physical meaning d) Only particle nature of photon			

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- 6 In atomic spectra, Balmer series of spectrum is found inregion and Lyman series found inRegion of electromagnetic spectrum. L1 2
a) IR and UV
b) Visible and UV
c) UV and microwave
d) UV and Visible
- 7 -----is called as an Inorganic benzene L2 3
a) Borane
b) Carborane
c) Borazine
d) Silicone
- 8 This therapy is used in the treatment of cancer is L2 3
a) Boron neutron capture
b) Aluminium neutron capture
c) Lithium neutron capture
d) Silicon neutron capture
- 9is used as rat poison L1 3
a) β -Black phosphorous
b) α -Sulphur
c) α -Black phosphorous
d) Graphite
- 10 H_3PO_4 is L6 3
a) monobasic
b) dibasic
c) tribasic
d) tetrabasic
- 11 C_{60} having L4 3
a) 12 pentagon and 20 hexagon
b) 20 pentagon and 12 hexagon
c) 12 hexagon and 20 pentagon
d) None of the above
- 12 Graphite is having L1 3
a) sp^2 hybridization
b) sp^3 hybridization
c) sp hybridization
d) None of the above

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- 13 CN^- is the example of L1 3
a) Interhalogen compound
b) Pseudo halide
c) Polymorph of carbon
d) One of the above
- 14 Arsenic is doped in Germanium crystal to get----- L5 4
Semiconductor
a) n-type
b) p-type
c) n-type and p-type both
d) None of the above
- 15 On the basis of band theory, solids are classified as L1 4
a) Metals and non-metals
b) Metals, Semiconductors and Insulators
c) Crystalline and amorphous solid
d) n-type and p-type
- 16 Band theory of solids is proposed by L1 4
a) Mullikan
b) Bohr
c) J.J. Thomson
d) None of the above
- 17 A Zener diode works also on L2 4
a) Forward Bias
b) Reverse Bias
c) Solar cell
d) None of the above
- 18 n-p-n Transistors have L2 4
a) Emitter-base-collector region
b) Collector-base-Emitter region
c) Solar cell
d) None of the above
- 19 Light emitting diodes (LED) is example of L2 4
a) Transistor
b) p-n Junction
c) Solar cell
d) None of the above
- 20 Zone refining method is used for L4 4
a) Synthesis of semiconductor material
b) Synthesis of nanomaterial
c) Synthesis of solar cell
d) None of the above

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Section B

		Marks	level	CO
Q.2	Solve any Two	12		
a)	Describe the hybridization with proper structure of xenon compounds XeF_2 , XeF_4 , and XeF_6 .	6	L2	1
b)	Discuss VSEPR theory with geometry, hybridization and proper structure for H_2O molecule.	6	L2	1
c)	Describe by using MO diagram the homonuclear diatomic N_2 molecule with proper structure and bond order.	6	L2	1
Q.3	Solve any Two	12		
a)	Solve the Schrodinger equation for particle in one dimensional box.	6	L3	2
b)	Write a note on Compton effect.	6	L3	2
c)	Derive the equation for Bohr energy.	6	L3	2

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Q.4 a)	Solve any Two of the following	12		
i)	What are the boranes? How they are classified? Explain synthesis, properties and structure of diboranes (B_2H_6).	6	L4	3
ii)	Write a note on polymorph of carbon.	6	L4	3
iii)	Write a note on polythiazenes i.e sulphur – nitrogen compounds?	6	L4	3
b)	Write note on any Four of the following	16		
i)	Silicones.	4	L2	3
ii)	Carbide.	4	L2	3
iii)	Oxyacid of sulphur.	4	L2	3
iv)	Phosphazenes.	4	L2	3
v)	Pseudo halides.	4	L2	3
Q.5 a)	Solve any Two of the following	16		
i)	With the help of energy level diagram and band theory explain the difference between metal, semiconductor and insulator.	8	L3	4
ii)	Explain Intrinsic and extrinsic semiconductor.	8	L3	4
iii)	Discuss in detail single crystal growth method for the synthesis of semiconducting materials?	8	L3	4
b)	Write note on any Three of the following	12		
i)	Solar cells.	4	L6	4

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ii) Transistors.	4	L5	4
iii) Light emitting diodes (LED).	4	L5	4
iv) Zone refining method.	4	L5	4

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