	Sanjay Ghodawat University, Kolhapur Established as State Private University under Govt. of Maharashtra. Act No XL, 2017	2018-19
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, 3rd June 2019	End Semester Examination	Time: 3 hrs, Max Marks: 100 <i>10.30 am to 11.00 am</i>
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

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|--|----|---|
| <p>1 XeF₂ molecule is</p> <p>a) Linear
b) Triangular planar
c) Pyramidal
d) Square planar</p> | L1 | 1 |
| <p>2 The Shape of the IF₇ molecule is</p> <p>a) Linear
b) Triangular
c) Pentagonal bipyramidal
d) Hexagonal</p> | L1 | 1 |
| <p>3 Bond order of O₂, O₂⁻ and O₂²⁻ is</p> <p>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</p> | L1 | 1 |
| <p>4 Mathematical expression of Stephan-Boltzmann law is.....</p> <p>a) σT^4
b) $\sigma T^{2/3}$
c) $\sigma T^{4\pi/3}$
d) $\sigma T - \sigma T^{2/3}$</p> | L2 | 2 |
| <p>5 de-Broglie proposed</p> <p>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</p> | L1 | 2 |

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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-----
Semiconductor | L5 | 4 |
| | 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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Day and Date: Monday, 3 rd June 2019	End Semester Examination	Time: 3 hrs, Max Marks: 100 11.00 am to 1.30 pm.
PRN:	Seat No:	

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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