QP CODE: D1BCH2402

Name: .....
Reg.No.: .....

FIRST SEMESTER FYUGP EXAMINATION NOVEMBER 2024

MINOR

CHE1MN 101 BASIC INORGANIC AND NANO CHEMISTRY

Time : 2 Hrs **Maximum Marks : 70**

BL - Bloom's Taxonomy Level (1 to 6) CO - Course Outcome

Section A

Ceiling Marks : 24

Answer all questions. Each carries 3 marks.

No.	Question	M	BL	CO
1.	What is the state of hybridisation of IF7?	3	3	CO2
2.	Calculate the bond order of O2 molecule on the basis of its MO configuration	3	3	CO2
3.	Write the MO configuration of O2 -, calculate its bond order and predict its magnetic behaviour	3	3	CO2
4.	Why is the second ionization enthalpy larger than the first	3	1	CO3
5.	What are redox titrations? Give an example	3	2	CO4
6.	(a) What are iodimetric titrations ? (b) Write the equation for the reaction between iodine and sodium thiosulphate	3	3	CO4
7.	Explain the term accuracy with regard to an analytical result	3	1	CO4
8.	How is solubility product principle effected in the separation of II group cations and IV group cations ?	3	3	CO4
9.	Explain the terms nanoparticles	3	1	CO5
10.	Discuss top-down nanofabrication methods with examples	3	2	CO5

Section B

Ceiling Marks : 36

Answer all questions. Each question carries 6 marks.

No.	Question	M	BL	CO
11.	Discuss (i) Pauli exclusion principle (ii) Aufbau principle with suitable examples	6	2	CO1
12.	(i) Derive the de Broglie relation. (ii) The kinetic energy of an electron (mass = 9.1 x 10-31 kg) is 4.55 x 10-25 J. Calculate the wavelength. (h = 6.6 X 10-34 J s)?	6	3	CO1
13.	Explain the significance of the terms HOMO and LUMO. Draw the MO energy diagram of O2 molecule and indicate the HOMO and LUMO for the molecule	6	3	CO2
14.	Write a short note on the different types of bonds found among substances	6	2	CO4
15.	Define the term molality. 7.48g of Potassium Chloride (KCl) dissolved in 100g of water. Calculate the molality of solution	6	3	CO4
16.	What are metal ion indicators? Explain complexometic titration with a suitable example	6	2	CO4
17.	A solution contains Al3+ and Ba2+ ions. How would you separate the ions and identify them	6	3	CO4
18.	Discuss the classification of nanomaterials based on nanoscale dimensionality	6	1	CO5

Section C

Answer any 1 question. Each carries 10 marks. (1x10=10 marks)

No.	Question	M	BL	CO
19.	What is meant by hybridization? Explain the molecular geometries associated with sp2 and sp3 hybridizations with illustrative examples	10	3	CO2
20.	(a) Discuss the factors that influence the electro negativity of elements. (b)Discuss the general trend in the variation of electronegativity along a period and down a group	10	2	CO3

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