P P SAVANI UNIVERSITY

Fifth Semester of B.Sc. Examination

Dec.-Jan.-2020-21

SSCH3010–Inorganic Chemistry-VI

08.01.2021, Friday | Time: 10:00 a.m. to 12:30 p.m. | Maximum Marks: 60

Section-A (Total Marks - 20)

Q.1 Objectives (20 MCQ Compulsory-1 mark each) **(20)**

1 BF_3 belongs to _____ point group
- **A** D_{3h}
- **B** C_{2v}
- **C** C_{2h}
- **D** C_{6h}

2 A _____ is an operation performed on an object which leaves it in a configuration that is indistinguishable from, and superimposable on, the original configuration.
- **A** symmetry operation
- **B** symmetry element
- **C** plane operation
- **D** plane element

3 N_2O_4 is planar. It contains _____ planes of symmetry
- **A** 1
- **B** 2
- **C** 3
- **D** 4

4 To what point group does S_8 belong?
- **A** D_{4d}
- **B** C_{2v}
- **C** C_{4v}
- **D** D_{4h}

5 SF_4 belongs to the _____ point group.
- **A** C_{4h}
- **B** C_{2v}
- **C** C_{4v}
- **D** D_{4h}

6 The most common solvent used by living organisms is
- **A** Benzene
- **B** Water
- **C** Toluene
- **D** Hexane

7 The dielectric constant of Liq. ammonia is
- **A** 22
- **B** 78.5
- **C** 22.7
- **D** 77

8 Reaction of AgCl and KNO_3 gives
- **A** No reaction
- **B** $AgNO_3$
- **C** KCl
- **D** Both KCl and $AgNO_3$

9 Metals are _____ in Liq. SO_2.
- **A** Soluble
- **B** Insoluble

C Partly soluble
D Can't be predicted

10 C_6H_6 is an example of _____ solvent.
A Protic
B Aprotic
C Both
D None

11 Lanthanides are also called
A Transition elements
B Inner transition elements
C Both transition and inner transition elements
D None of the above

12 Which of the following is artificially synthesized
A Promethium
B neodymium
C europium
D All of the above

13 The Pm^{+3} ions show _____ color.
A pink
B yellow
C Pale pink
D lilac

14 The atomic radius _____ from Ce to Lu.
A increases
B decreases
C Shows mixed trend
D Do not change

15 The atomic number of neodymium is
A 59
B 60
C 61
D 62

16 Oxocations formation is a property of _____.
A Lanthanides
B Actinides
C Both
D None

17 Which of the following oxidation state is not shown by Thorium
A +2
B +3
C +4
D +5

18 The color of the compound $NpCl_4$ is
A Red-brown
B brown

C green
D purple

19 The group of fourteen elements from thorium (Th, Z = 90) to lawrencium (Lr, Z=103) are called
A actinides
B actinoids
C actinons
D All of the above

20 The atomic number of fermium is
A 99
B 100
C 101
D 102

Section-B (Total Marks - 40)

Q.1 Short Notes (attempt all four- 3 marks each) **(12)**

A State the physical properties of Lanthanides.
B Discuss the differences between Lanthanides and Actinides.
C Determine the point group of $POCl_3$.
D What are solvents? Classify them.

Q.2 Explain in detail (attempt any four-7 marks each) **(28)**

A Why the solutions of alkali metals in Liquid ammonia is blue colored? What are the advantages and disadvantages of Liq. SO_2.
B Discuss Acid-Base reactions in Liq. ammonia.
C Define and explain with an example:
1. Symmetry element
2. Rotation axis
3. Plane of reflection
D Write a detailed note on Lanthanide contraction.
E Discuss the methods for the purification and extraction of Uranium.