

M,SC SEM 1 ATKT INORGANIC CHEMISTRY 2020

MOCK TEST -16/09/2020

Q.1 What is the point group of Trans-dichloro ethylene?

- a) C_{2v}
- b) C_{2h}
- c) D_{3h}
- d) D_{4h}

Q.2. How many classes are present in C_{2v} point group?

- a) 2
- b) 3
- c) 4
- d) 6

Q.3. Symmetry elements /operation in C_{3v} point group are

- a) $3C_2, 2C_3, 3S_3$
- b) $E, C_3^1, C_3^2, \sigma_V, \sigma_V', \sigma_V''$
- c) $E, 2C_3, 3C_2, \sigma_V, \sigma_V', \sigma_V''$
- d) $E, C_3^1, C_3^2, \sigma_V, \sigma_V', \sigma_V'', S_3^1$

Q.4 How many classes are present in C_{3v} point group?

- a) $E, 3C_3, 3\sigma_v$
- b) $E, 3C_3, 2\sigma_v$
- c) $E, 2C_3, 3\sigma_v$
- d) $E, 2C_3, 4\sigma_v$

Q.5. How many symmetry elements /operations are present in D_{3h} point group?

- a) $E, 2C_3(z), 3C_2, \sigma_h, 3\sigma_v, 2S_3$
- b) $E, 3C_3(z), 3C_2, \sigma_h, 2\sigma_v, 2S_3$
- c) $E, 2C_3(z), 3C_2, \sigma_h, 4\sigma_v, 7S_3$
- d) $E, 4C_3(z), 3C_2, \sigma_h, 2\sigma_v, 1 S_3$

Q.6 The product of two elements must be the member of the group, if

$\mathbf{A \cdot B = C \ \& \ B \cdot A = C}$ the group is:

- a) Nonabelian group
- b) Abelian group
- c) abelian & nonabelian

d) S.T.T.

Q.7. Each element has a reciprocal, which is also an element of the same group. This rule is

a) Identity rule

b) inverse rule

c) closure property

d) associative law

Q.8 According to Mulliken's notations if E is bidirectional, what is the symbol for this?

a) A

b) B

c) E

d) F

Q.9 Mulliken's notations for centre of symmetry is :

a) u & g

b) x & y

c) x & u

d) z & g

Q.10 Classes are the representations.

a) Irreducible representations

b) Reducible representations

c) abelian group

d) nonreducible

Q.11. SO₂ belongs to which point group?

a) C_{3v}

b) C_{2v}

c) D_{3h}

d) D_{4h}

Q.12 "Classification of set of symmetry elements constitute a group" known as

a) Order of the group

b) group

c) Point group

d) symmetry operation of the group

Q.13 Which of the following molecules or ions possesses an inversion (centre of symmetry)?

- a) $[\text{PF}_6]^-$
- b) CH_4
- c) SF_4
- d) $\text{Si}(\text{CH}_3)_4$

Q.14. The number of degree of vibrational freedom possessed by CH_4 ...

- a) 10
- b) 9
- c) 5
- d) 3

Q.15 Which statement is true about the change in symmetry on going from BF_3 to $[\text{BF}_4]^-$

- a) The point group changes from D_{3h} to T_d .
- b) The point group changes from C_{3v} to T_d .
- c) The point group changes from D_{3h} to O_h
- d) The point group changes from C_{4v} to T_d .

Q.16 Q.1. Hydrogen bonding is exhibited by

- a) All molecules in which H is present.
- b) Molecules in which two H atoms are present.
- c) Molecules in which H is covalently bonded to F, O, N.
- d) Molecules in which H is bonded to atom with electronegativity greater than 2.1.

Q.17. Which of the following H bonds are expected to have maximum strength.

- a) $\text{H} \cdots \text{O} \cdots \text{H}$
- b) $\text{H} \cdots \text{N} \cdots \text{H}$
- c) $\text{H} \cdots \text{S} \cdots \text{H}$
- d) All have same strength

Q.18. In solid Argon the atoms are held by

- a) ionic bond
- b) Hydrogen bond
- c) Vanderwaals forces
- d) Co-ordinate bond

Q.19. The Hybrid orbitals have better directional properties & can form ----- bonds.

a) Weaker

b) stronger

c) shorter

d) long

Q.20. Each B---H----B bridge in B₂H₆ involves-----

a) 2C—2e

b) 2C---3e

c) 3C--2e

d) 1C--2e

ANSWER KEY FOR MOCK TEST MSC SEM -1 ATKT INORGANIC CHEMISTRY

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|-------------|----------|-------------|----------|
| Q.1 | B | Q.11 | B |
| Q.2 | C | Q.12 | C |
| Q.3 | B | Q.13 | A |
| Q.4 | C | Q.14 | B |
| Q.5 | A | Q.15 | A |
| Q.6 | B | Q.16 | C |
| Q.7 | B | Q.17 | A |
| Q.8 | C | Q.18 | C |
| Q.9 | A | Q.19 | B |
| Q.10 | B | Q.20 | C |