

## CHEMISTRY SEM-2 QUESTION BANK INTERNAL-1

1. Which d-block element shows maximum oxidation states?

- A) Fe
- B) Mn
- C) Cu
- D) Zn

**Answer:** B

2. The colour of transition metal compounds is due to:

- A) Atomic size
- B) d-d transitions
- C) Metallic bonding
- D) Ionization energy

**Answer:** B

3. Which metal is not a transition element?

- A) Fe
- B) Cu
- C) Zn
- D) Mn

**Answer:** C

4. Lanthanide contraction is due to:

- A) Poor shielding of 4f electrons
- B) Increase in atomic size
- C) Strong nuclear force
- D) Presence of d-electrons

**Answer:** A

5. Most common oxidation state of lanthanides is:

- A) +1
- B) +2
- C) +3
- D) +4

**Answer:** C

6. Actinides show more variable oxidation states because of:

- A) Larger size
- B) Participation of 5f, 6d, 7s electrons
- C) Low density
- D) Low atomic number

**Answer:** B

7. Which actinide is used as nuclear fuel?

- A) Thorium
- B) Uranium
- C) Neptunium
- D) Plutonium

**Answer:** B

8. SN1 reaction proceeds through:

- A) Free radical
- B) Carbocation
- C) Carbanion
- D) Carbyne

**Answer: B**

9. Rate of SN1 reaction depends on:

- A) Concentration of nucleophile
- B) Substrate only
- C) Solvent only
- D) Temperature only

**Answer: B**

10. SN2 reaction is:

- A) Two-step
- B) First order
- C) Single-step
- D) Rearrangement prone

**Answer: C**

11. Which alcohol is most acidic?

- A) Methanol
- B) Ethanol
- C) Phenol
- D) Propanol

**Answer: C**

12. Lucas test is used to distinguish:

- A) Alcohols
- B) Aldehydes
- C) Ketones
- D) Acids

**Answer: A**

13. Ethers are prepared by Williamson synthesis using:

- A) Acid + alcohol
- B) Alcohol + alkyl halide
- C) Alkene + water
- D) Ketone + alcohol

**Answer: B**

14. Which compound gives Tollen's test?

- A) Ketone
- B) Aldehyde
- C) Ether
- D) Alcohol

**Answer: B**

15. Aldol reaction occurs in:

- A) Aldehydes without  $\alpha$ -H

- B) Ketones without  $\alpha$ -H
- C) Aldehydes and ketones with  $\alpha$ -H
- D) Acids

**Answer:** C

16. Carbonyl group is:

- A) Polar
- B) Non-polar
- C) Neutral
- D) Aromatic

**Answer:** A

17. Which has highest boiling point?

- A) Ether
- B) Alkane
- C) Alcohol
- D) Alkene

**Answer:** C

18. Phenol reacts with NaOH because it is:

- A) Basic
- B) Neutral
- C) Acidic
- D) Amphoteric

**Answer:** C

19. Transition metals act as good catalysts because they:

- A) Are reactive
- B) Have variable oxidation states
- C) Have large size
- D) Are non-metals

**Answer:** B

20. Which compound shows nucleophilic addition?

- A) Alkene
- B) Alkyne
- C) Aldehyde
- D) Alkane

**Answer:** C

## Fill in the Blanks

1. D-block elements belong to groups **3–12**.
2. Lanthanides involve filling of **4f** orbitals.
3. Actinides are mostly **radioactive**.
4. SN1 reaction follows **first-order** kinetics.
5. SN2 reaction occurs with **inversion** of configuration.
6. Phenol is more acidic than alcohol due to **resonance**.
7. Williamson synthesis produces **ethers**.
8. Carbonyl group contains **C=O** bond.

9. Tollen's reagent contains **silver**.
10. Aldehydes are oxidized to **carboxylic acids**.
11. Ketones do not give **Tollen's test**.
12. Lanthanide contraction decreases **atomic radius**.
13. The general formula of alcohol is **R-OH**.
14. Lucas reagent contains **ZnCl<sub>2</sub>** and **HCl**.
15. SN<sub>2</sub> reaction is favoured by **primary** alkyl halides.
16. Carbonyl carbon is **electrophilic**.
17. Phenol reacts with bromine water giving **white precipitate**.
18. Transition metals form **complexes**.
19. Actinides involve **5f** orbitals.
20. Aldol reaction forms **β-hydroxy aldehyde/ketone**.

### III. Descriptive Questions

1. Explain the colour, variable oxidation states, magnetic properties of d-block elements?
2. Explain the complex formation and catalytic properties, formation of alloys of transition elements?
3. What is lanthanide contraction, and its consequences?
4. Explain nucleophilic substitution reactions 1&2?
5. Canizaro reaction, Clementine reduction, Wolf Kishner reduction?