CHEMISTRY 9th (New Book)

CHAPTER NO 13 LABORATORY AND PRACTICAL SKILLS

Exercise: Multiple Choice Questions

1.	A shared responsibility	2.	All of them
3.	That user should be careful when using chemical	4.	That its contact destroys living tissue
5.	Potassium cyanide	6.	Picric acid
7.	Always add acid to water	8.	Close gas valves and turn off all equipments

Q#2: Short Question Answer

i. Name some corrosive chemicals.

Corrosive Chemicals:

Acids:

1. Sulphuric Acid (H_2SO_4)
2. Hydrochloric Acid (HCl)
3. Nitric Acid (HNO_3)

Bases:

4. Sodium Hydroxide (NaOH)
5. Potassium Hydroxide (KOH)

ii. What type of safety precautions are adopted to avoid damage due to explosive chemicals?

Safety Precautions:

1. We should obtain prior approval from your teacher.
2. We should always use smallest quantity of the chemicals.
3. We should always conduct experiment in fume hood.
4. We should remove all other chemicals and apparatus around you.
5. We should inform other people working with you.

iii. What type of damages can reactive chemicals cause?

Types of Damages:

- When chemical reactions are not properly performed, they may cause fires, explosions as they may evolve dangerous gases.
- These reactions may result to an **extreme damage to life and property**.

iv. Indicate two such safety instructions which are required to avoid radiation.

1. Stay inside as walls and ceilings can protect you from radiation fall out.
2. Never operate equipment that produces radiation without sufficient training.

v. Which chemicals can cause suffocation?

Asphyxiation Hazards:

It is a type of hazard in which a gas or vapour can or unconscious cause suffocation.

Examples of chemical asphyxiants are **hydrogen cyanide, carbon monoxide, nitrogen, argon, helium, methane and carbon dioxide etc.**

vi. Why signs and symbols are posted on lab and chemical bottles?

Signs and Symbols:

Several signs and symbols are posted in different areas of the lab and bottles containing hazardous chemicals. Because these specific signs indicate precautions must be observed according to the requirements sign posted there. If you see such signs, you must be alert and take extra care to maintain safety in that area.

vii. How fire caused by chemicals should be handled?

Fire Handling:

The following points should be kept in mind to cope with the emergency situation:

1. Stay calm and do not panic.
2. Alert people in the area of evacuate.
3. In case of fire, close doors to confine fire. Use fire extinguisher to put down the fire.
4. Call and assist emergency staff.

viii. Why emergency drills are important to face emergency situations?

Emergency Situation:

Students should make themselves aware of the actions that need to be taken in case of an emergency in a laboratory or if a person is affected. For this purpose periodic drills should be held with compulsory participation. Students should not only have been given lectures but involve them practically to handle the emergency situations. During drill firefighting and other equipment must be checked whether they are in proper working order or not.

Q#3: Constructed Response Questions

i. How will you handle an emergency situation caused by fire due to short circuiting?

Short Circuit Handling:

If a fire occurs due to short-circuiting, here is how to handle an emergency situation:

- Immediately switch off the main power supply to stop the electrical current.
- Immediately yell "Fire!" to alert everyone in the surrounding. This helps ensure that everyone is aware of the situation.
- If it is safe to do so, call emergency services or have someone else do it. Provide them with the necessary information about the location and nature of fire.
- If the fire spreads or cannot be controlled, evacuate the laboratory immediately and ensure others do the same.

- If the fire is small and you have been trained to use a fire extinguisher, you can attempt to put it out.
- Do not re-enter the building until emergency services declare it safe.

ii. What type of reactions should be carried out in fume cupboard?

Type of reactions:

Reactions that should be carried out in a fume cupboard include:

- Reactions involving toxic, volatile, or harmful gases or vapors, such as chlorine, ammonia, or hydrogen sulfide.

- Reactions that are potentially explosive or highly exothermic, which may release dangerous fumes or heat.
- Use of flammable solvents where vapors might ignite if exposed to an ignition source.
- Handling of corrosive substances that can emit harmful fumes (e.g., concentrated hydrochloric or nitric acid).

iii. Put forward at least two suggestions to improve safety in the lab.

1. **Ensure proper labeling and storage of chemicals** – All chemicals should be clearly labeled with hazard symbols and stored according to compatibility to prevent dangerous reactions.
2. **Provide regular safety training and emergency drills** – All lab users should be trained in safety procedures, proper equipment use, and emergency responses such as fire, spills, or exposure.

iv. Can you identify warning symbols posted for radiation and asphyxiant chemicals?

v. Why sudden shock can cause some chemicals to explode?

Reason:

Some chemicals are **shock-sensitive**, meaning they can decompose violently or detonate when exposed to sudden physical impact, friction, or vibration. This happens because:

1. **Unstable chemical bonds** – These chemicals have weak or strained molecular structures that can easily break apart when disturbed.
2. **Rapid energy release** – When the bonds break suddenly (due to shock), a large amount of stored chemical energy is released all at once, causing an **explosion**.
3. **Exothermic decomposition** – Shock can trigger a self-accelerating, exothermic (heat-releasing) reaction that spreads rapidly through the material.

Examples of shock-sensitive chemicals:

- Nitroglycerin
- Picric acid (if dried)
- Azides (like lead azide)
