

## S.5 CHEMISTRY HOLIDAY WORK, TERM 3 2025

### ITEM 1

In Masindi Municipality, a small chemical company manufactures perfumes and plastic softeners using but-1-ene as a starting material for manufacturing alcohols, halogenoalkanes, and dihalides.

Over the past two months, the surrounding community has raised complaints about:

- ✓ Strong choking fumes being released during production.
- ✓ Workers suffering from eye irritation and breathing difficulties.
- ✓ Incorrectly produced batches of perfume additives due to uncontrolled reactions involving but-1-ene and leaking reagents like hydrogen bromide, chlorine, and acidified water.

Foul-smelling wastewater entering the nearby drainage system. A government health and safety audit shows that the company poorly understands how electrophilic addition reactions occur and how reactive reagents should be controlled. The management seeks a chemistry student (you) to explain the reactions of but-1-ene with the substances involved

**Task:** As a chemistry student; make a scientific write up you would present to the management in organised one-day workshop

### ITEM 2:

In a rural Ugandan community, a local agro-processing cooperative wants to manufacture small quantities of useful organic compounds for educational and industrial purposes. They have limited chemicals and need to ensure safety and efficiency. The cooperative has tasked a group of chemistry students to synthesize several compounds from available starting materials: pent-2-yne from ethanol; 1-bromopropan-2-ol from calcium dicardide; 1-chlorobutane from 1,2-dichlorobutane, and 1-bromopropane from 2-bromobutane, using chemicals and stating suitable conditions at each step.

**Task:** As a chemistry student; make a scientific write up you would present to a local agro-processing cooperative in organised one-day workshop.

### ITEM 3

In Jinja city, a new metal-fabrication workshop has recently opened. The workshop uses several Period 3 elements to produce electrical cables, metal frames, and fertilizer additives.

After a few months of operation, residents began to report several problems:

- ✓ Some storage containers exploded due to metals reacting violently when they accidentally came into contact with water.
- ✓ Workers developed skin burns because poorly disposed metal scraps reacted with dilute sulphuric acid that leaked from cleaning tanks.
- ✓ The drainage system got blocked by lumps formed when some elements reacted with sodium hydroxide solution.
- ✓ A section of the workshop caught fire when some elements reacted with oxygen.

The local authorities request a chemistry student (you) to help the company management understand how different Period 3 elements react with water, dilute acids, strong alkali, and oxygen, so that they may improve safety and waste disposal.

**Task:** As a chemistry student, make a scientific write-up you would present to the local authorities and company management at an organised one-day workshop