# 1 - Development of practical skills worth at least 15% or more of total exam marks from the specification

## 1.1.1 - 1.1.4 Planning| Implementation |Analysis| Evaluation| skills assessed in a written examination

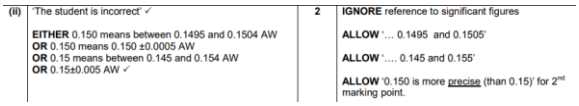
| | |
|---|---|
| Give 4 examples of readings and 4 examples of measurements? | Reading<br>● Thermometer<br>● pH meter<br>● balance<br>● Measuring cylinder<br>● Volumetric flask<br>Measurement<br>● Ruler<br>● Stopwatch<br>● Analogue meter<br>● burette |
| What are the 2 types of errors? | 1. Random (eliminated by repeating)<br>2. Systematic |
| What are standard solutions? | A solution for which its concentration is known accurately |
| What 3 things should you ensure when making standard solutions? | 1. Ensure you have clean dry equipment<br>2. Make washings to remove any salt **BEFORE MAKING** up the solution to the specified amount<br>3. Invert the volumetric flask to ensure everything is dissolved |
| Give 2 ways of improving an experiment that uses a gas syringe? | 1. Let the reaction carry on until the gas syringe has stopped moving<br>2. Wait for the gas to cool to room temperature before reading |
| There is no point writing 0.150 mol dm-3. Writing 0.15 mol dm-3 means the same thing.<br>**(ii)** A student says:<br>'There is no point writing 0.150 mol $dm^{-3}$ for the $Na_2CO_3$ solution. Writing 0.15 mol $dm^{-3}$ means the same thing.'<br>Discuss whether or not the student's statement is correct.<br>.....<br>.....<br>.....<br>..... **[2]** |  <br>**(ii)** 'The student is incorrect' ✓ — **2** — **IGNORE** reference to significant figures<br>**EITHER** 0.150 means between 0.1495 and 0.1504 AW<br>**OR** 0.150 means 0.150 ±0.0005 AW<br>**OR** 0.15 means between 0.145 and 0.154 AW<br>**OR** 0.15±0.005 AW ✓<br>**ALLOW** '… 0.1495 and 0.1505'<br>**ALLOW** '…. 0.145 and 0.155'<br>**ALLOW** '0.150 is more precise (than 0.15)' for 2nd marking point.<br>● The student is incorrect (1)<br>● 0.150 means between 0.1495 and 0.1504<br>*IGNORE reference to significant figures* |

**Fig. 2.2** shows some information found on a bottle of ethanoic anhydride.

The students use the information in **Fig. 2.2** to write a risk assessment for ethanoic anhydride.

| Ethanoic anhydride | Hazards |
|---|---|
|  | Flammable<br>Harmful by inhalation and if swallowed<br>Corrosive – causes burns |

**Fig. 2.2**

Suggest **three** precautions that the students should take when using ethanoic anhydride.

1 .....

.....

2 .....

.....

3 .....

.....

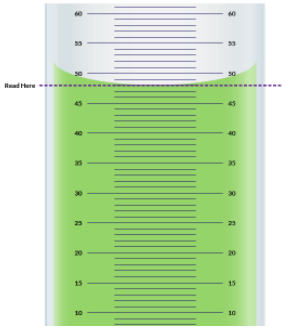
**[3]**

Suggest three precautions that the students should take when using ethanoic anhydride (3)?

- Keep away from flames (1)
- Use in fume cupboard (or well ventilated lab) (1)
- Wear gloves (protective) (1)

| | | | |
|---|---|---|---|
| Keep away from flames ✓ **AW**<br>Use in fume cupboard/well ventilated lab ✓<br>Wear (protective) gloves ✓ | **3** | **3.2 x3** | **Allow** (lit) Bunsen burners/sparks<br>**IGNORE goggles** |

## 1.2.1 Practical skills | Use of apparatus & techniques| assessed in the practical endorsement

| | |
|---|---|
| How should you take (not calculate) readings from a burette? | Reading from the bottom of the meniscus at eye level against a constant background<br>  |
| How should burette measurements be recorded | • Should be recorded to 2.d.p<br>• Should end in 0 or 5<br><br>*This does not include the mean titre which doesn't have to end in 5 or 0* |
| What should be done near the endpoint of a titration? | Add the solution dropwise |
| How should you perform mean titres? | 1. Repeat titrations until there are two concordant titres (within 0.1cm$^3$)<br>2. Take an average of the concordant titres<br>3. Round to 2 d.p (if required) |
| By what 4 ways can you heat reactions? | 1. Water bath<br>2. Electric heater |

| | |
|---|---|
| | 3. Sand bath<br>4. Bunsen burner |
| By what 2 ways can you purify products | 1. Solids by recrystallisation<br>2. Liquids by separating funnel or distillation |
| Why does the student carry out a trial titration? (1)<br>**(ii)** Why does the student carry out a trial titration?<br>.....<br>..... **[1]** | <table><tr><td>(ii)</td><td>To estimate the titre ✓</td><td>1</td><td>AO2.3</td><td>**ALLOW** 'getting a rough idea of the titre' (or similar wording)</td></tr></table><br>● To estimate the titre<br><br>*This is from an AS OCR A 2021 Past paper* |