

**UNIVERSITY OF SWAZILAND**

**FACULTY OF EDUCATION**

**SUPPLEMENTARY EXAMINATION PAPER 2006**

**B. Ed. II AND PGCE F/T**

**Title of paper** : Curriculum Studies in Chemistry

**Course number** : EDC 279

**Time allowed** : 3 hours

**Instructions** :

1. This paper contains five questions
2. Question 1 is COMPULSORY. You may then choose ANY THREE questions from questions 2, 3, 4, 5
3. Each question is worth 25 marks
4. Any piece of material or work which is not intended for marking purposes should be clearly CROSSED OUT
5. Ensure that responses to questions are NUMBERED CORRECTLY

**Special Requirements** NONE

**THIS PAPER SHOULD NOT BE OPENED UNTIL PERMISSION HAS BEEN GRANTED BY THE INVIGILATOR**

## QUESTION 1

### This question is compulsory

- a) *“The aims, purposes and effectiveness of practical work in science have been the subject of much debate. The consensus view is that much practical work serves only to develop manipulative skill and is not very effective in helping students grasp concepts.”* Byrne, 1990:12)

Discuss the basis of this view to illustrate why practical work is sometimes not effective in meeting its other aims? [10]

- b) Below is a unit topic taken from the Integrated Science Syllabus for Swaziland. Use this topic to justify the inclusion of science in the junior secondary school curriculum. [15]

#### ***The air and living things***

*Simple preparation of oxygen and carbon dioxide; identification and simple properties of oxygen, carbon dioxide and nitrogen (both lime-water and bicarbonate indicator tests for carbon dioxide)*

*Word equations introduced as a supplementary means of recording some of the above changes. Comparative combustion in air and oxygen; air as “diluted” oxygen; approximate composition of air, including noble gases; nitrogen as a relatively inert gas. Combustion of carbohydrates and other organic materials in oxygen*

*Differences between inhaled and exhaled air (including temperature) comparison of respiration and combustion; breathing-the lungs, diaphragm, etc; respiration as gaseous interchange in blood, tissues, etc; maintaining body temperature; introduction to circulatory systems; effects of exercise on breathing and pulse rates and (partial) explanation.*

*Respiration in plants and germinating seeds; photosynthesis; carbon/oxygen cycle.*

## QUESTION 2

- a. A teacher wants to use the following methods of assessment with her/his pupils:
- i) Objective tests
  - ii) Free response structured tests

Write down **two** advantages **each** of using each type of assessment method in appraising pupils' work. [8]

- b. How might a teacher assess learning through the use of practical tasks? [6]

- c. Box 1 attached is selected question from a specimen IGCSE examination paper. Construct a detailed marking guide that could be used to mark this question. [11]

## QUESTION 3

- a. Discuss the spatial arrangements you would make in readiness to teach a lesson in chemistry using the following teaching methods:

- i. Demonstration
- ii. Discussion [10]

- b. Explain what is meant by "wait time" logic control and explain its benefits for teaching. [5]

- c. Discuss the use of the following types of questions during a lesson:

- i) cognitive memory questions [5]
- ii) higher order questions. [5]

## QUESTION 4

- a. "School can be used to promote gender equity in science and technology fields".

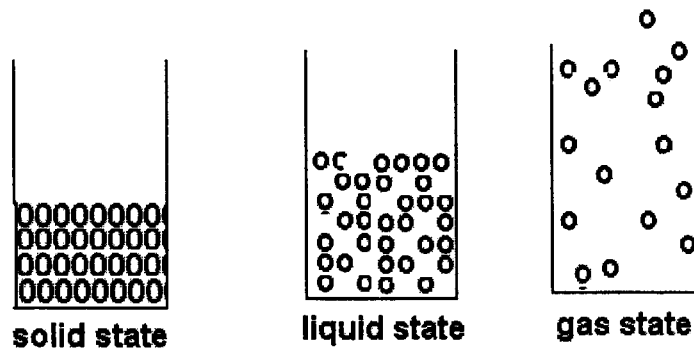
Show the strengths and weaknesses of this statement. [10]

- b. Some people believe that it is a waste of time to attempt to raise women to the same academic standards as men in the sciences.

- i. What factors might have contributed to this view? [8]
- ii. How justified is this view? [7]

### QUESTION 5

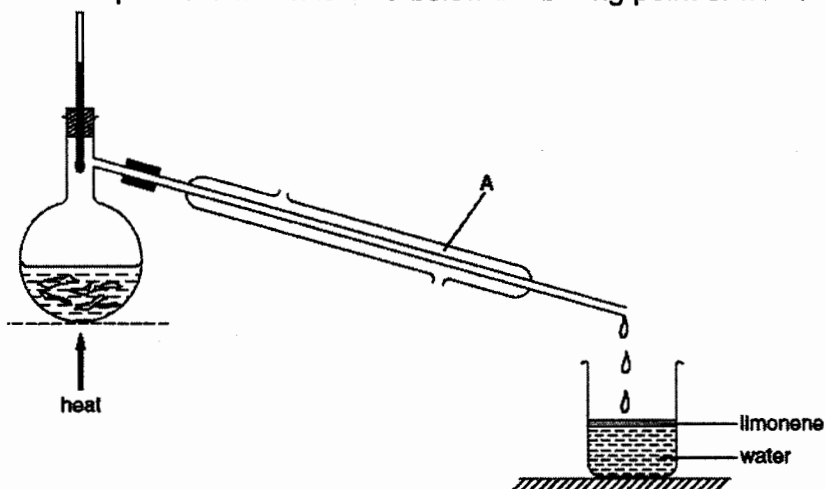
Study the diagram shown below, which is taken from a text book that is used as a reference book by chemistry teachers.



- a. Critique the use of this diagram in teaching about the states of matter. [10]
- b. Construct a lesson plan that you could use to develop appropriate conceptions of the kinetic particulate nature of matter and to address the misconception identified in (a) above. [15]

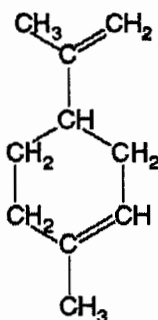
**BOX 1**

Limonene is a liquid hydrocarbon found in orange peel. It can be extracted by boiling the orange peel with water, using the apparatus shown below. The mixture of limonene and water distils at a temperature which is 1 °C below the boiling point of water.



- (a) (i) State the name of the piece of apparatus labelled A.  
 .....[1]
- (ii) Suggest what the reading on the thermometer will be when the limonene-water mixture is being distilled..... °C [1]
- (iii) Limonene is less dense than water. What information in the diagram shows this?.....[1]

(b) The structure of limonene is shown below.



- (i) What is the molecular formula of limonene?  
 .....1
- (ii) Some limonene was added to a few drops of aqueous bromine.  
 What colour change would you see in the aqueous bromine?  
 .....[2]
- (iii) What feature of a limonene molecule is responsible for this colour change?  
 .....[1]
- (iv) Name the two substances formed when limonene is burnt in an excess of oxygen.  
 ..... and .....[2]

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