



**2005 VCE VET Laboratory Skills GA 2: Written examination**

**GENERAL COMMENTS**

Students generally performed well, particularly on the multiple-choice sections of the paper. However, a number of students did not read or understand the instructions properly and attempted all three electives. Marks could only be given for two electives; therefore in such situations, only electives 1 and 2 were marked.

This year, all electives were chosen by students, including PMLTEST 301A Perform biological laboratory procedures, which no students in 2004 attempted.

Papers were marked strictly according to the marking guide. In some cases two correct answers were required to gain a mark – no marks were given if only one correct answer was supplied.

**Areas of strength**

- Students performed well in the multiple-choice questions.
- A good understanding of hazards and dangerous goods categories.

**Areas of weakness**

- As in previous years, students did not perform well on the questions from the unit of competence PMLTEAM 300A, perhaps due to their lack of workplace experience. Training package support materials for the Laboratory Operations Training Package, including PMLTEAM 300A, are available from Australian Training Products. These should be used by teachers and students.
- Stoichiometry questions.
- Basic definitions in PMLTEST 303A Prepare working solutions. For example, standard, diluent, stock and working solutions.

**SPECIFIC INFORMATION**

**Section 1 – Core units**

**Multiple-choice**

Question	Correct Response
1	C
2	B
3	A
4	D
5	C
6	C
7	D
8	A
9	C
10	A

**Question 11a.**

Marks	0	1	2	3	Average
%	23	17	20	40	<b>1.8</b>

- recycle where possible
- switch off equipment when it is not in use
- reduce waste
- do not prepare too much material for the testing to be performed
- follow procedures properly
- avoid overuse of chemicals
- avoid spills
- maintain efficient work practices
- purchase only the required amount of chemicals to ensure fewer losses due to expired products
- use natural lighting

# 2005 Assessment Report



## Question 11b.

Marks	0	1	2	3	4	Average
%	33	10	23	20	13	1.7

- Recycle where possible: materials should be recycled; however, it is important to consider safety and that no contaminated material is sent for recycling.
- Switch off equipment: this saves energy and money, but the amount of use and warm-up time must be considered when deciding which machines to be switched off. Unnecessary lighting, heating and cooling should always be turned off.
- Do not prepare too much material for the testing to be performed: some reagents are expensive and can deteriorate if diluted or not stored correctly. Therefore, only the amount required immediately should be prepared and the rest should be stored appropriately.
- Follow procedures properly: calculate the amount required before starting any experiment or series of tests.
- Purchase only the required amount of chemicals: this reduces losses, but not ordering sufficient amounts can cause expensive delays and incur additional delivery costs.

## Question 12

Marks	0	1	2	3	4	Average
%	30	37	17	3	13	1.4

### i. non-conformance

- a term used to describe anything that does not meet or continue to meet a specified requirement or series of requirements
- the departure of a quality characteristic from its intended level or state that occurs with sufficient severity to cause an associated product or service not to meet a specification requirement

### ii. compliance

acting according to certain accepted standards, procedures or laws

### iii. NATA

National Association of Testing Authorities

### iv. QA

Quality assurance.

- a planned and systematic pattern of all actions that are necessary to impart confidence that the product optimally fulfils customer's expectations
- a planned and systematic set of activities to ensure that requirements are clearly established and the defined process complies with these requirements

## Question 13

Marks	0	1	2	3	Average
%	7	0	47	47	2.4

- ensure hotplate is switched off and the plug is disconnected before touching the hotplate
- check the chord for damage
- tag the hotplate so it will not be used until properly checked
- report the incident to a supervisor
- have the equipment checked by a qualified technician

## Question 14a.

Marks	0	1	2	Average
%	27	63	10	0.9

A goal-based work team, as the members were concentrating on the problem not on the teamwork needed to solve it.

## Questions 14b–c.

Marks	0	1	2	3	4	Average
%	13	7	40	23	17	2.3

### 14b.

- recognition of other team members' feelings

# 2005 Assessment Report



- ability to see things from others' points of view
- trust

14c.

- apply previous experience to the present situation
- encourage a frank expression of ideas
- recognise other team members' needs and feelings
- consider other team members' feelings
- consider other points of view
- share ideas and information
- value other peoples' ideas
- agree on a solution
- brainstorm the problem

## Section 2 – Electives

### Elective 1 – PMLTEST 300A Perform basic tests

#### Multiple-Choice

Question	Correct Response
1	C
2	A
3	C
4	C
5	A
6	B
7	A
8	B
9	C
10	B

#### Questions 11a–b.

Marks	0	1	2	Average
%	17	67	17	1.0

11a.

household bleach

11b.

green

#### Question 11c.

Marks	0	1	2	Average
%	17	8	75	1.6

apple juice because it is more acidic

#### Questions 11d–e.

Marks	0	1	2	Average
%	4	88	8	1.1

11d.

$\text{pH} = -\log_{10}[\text{H}_3\text{O}^+]$

11e.

- to calibrate the pH meter
- to ensure the measurements are accurate
- because buffer solutions have a known pH

# 2005 Assessment Report



## Question 12

Marks	0	1	2	3	4	5	6	Average
%	0	0	0	4	13	46	38	5.2

i.

pH meter: measures the pH of a solution

ii.

top loading balance: weighs substances accurately to two or three decimal places

iii.

fume hood: removes vapours from the room to protect the operator

## Questions 13a–b.

Marks	0	1	2	Average
%	46	4	50	1.1

13a.

A precipitate is a solid which forms when two or more solutions are mixed together.

13b.

AgCl, silver chloride

## Question 13c.

Marks	0	1	2	3	4	Average
%	67	8	17	8	0	0.7

- Step 2: filter solution and collect precipitate
- Step 3: wash filtrate to remove soluble impurities
- Step 4: dry in an oven to remove moisture
- Step 5: weigh precipitate (subtract the mass of the filter paper to determine the weight of the precipitate)

## Question 13d.

Marks	0	1	2	Average
%	83	8	8	0.3

molar mass of AgCl from the periodic table

## Elective 2 – PMLTEST 301A Perform biological laboratory procedures

### Multiple-choice

Question	Correct Response
1	A
2	C
3	A
4	A
5	C
6	C
7	B
8	A
9	A
10	B

## Question 11a.

Marks	0	1	2	Average
%	70	20	10	0.4

- preserve tissues in as life-like a state as possible
- prevent autolysis or putrefaction

# 2005 Assessment Report



## Question 11b.

Marks	0	1	2	Average
%	60	40	0	0.4

- formalin
- alcohol
- picrate solutions
- aldehydes

## Question 11c.

Marks	0	1	2	3	Average
%	70	10	20	0	0.5

- buffering/pH
- penetration
- volume
- temperature
- concentration
- time

## Question 12

Marks	0	1	2	3	Average
%	20	10	20	50	2.0

- Eyepiece: a lens next to the eye which magnifies the image from the objectives (usually 10×).
- Objective: the lens closest to the specimen, which magnifies the specimen.
- Focus adjustment controls: moves the stage incrementally to focus on the specimen.

## Question 13a–b.

Marks	0	1	2	3	Average
%	50	40	0	10	0.7

### 13a.

Serum is the fluid which remains after blood or plasma has clotted; that is, fibrinogen form fibrin.

### 13b.

An anticoagulant is a substance that prevents blood from clotting.

## Question 13c.

Marks	0	1	2	Average
%	100	0	0	0.0

Any two of:

- EDTA
- heparin
- sodium citrate
- sodium oxalate
- sodium fluoride.

Students did not obtain any marks for this question, presumably because the topic was not covered in schools. When tests such as counting red and white cells are performed, it is essential that blood does not clot before reaching the laboratory.

## Question 14a.

Marks	0	1	2	3	Average
%	10	60	30	0	1.2

- smear is too thick
- over decolourisation
- over washing of counterstain
- poorly made stains
- overheating during fixing

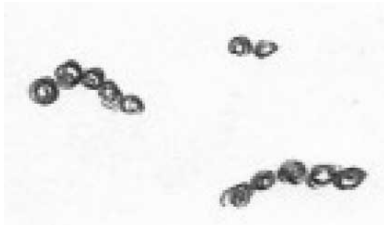
# 2005 Assessment Report



## Questions 14b–c.

Marks	0	1	2	Average
%	80	10	10	0.3

14b.



14c.



## Elective 3 – PMLTEST 303A Prepare working solutions

### Multiple-choice

Question	Correct Response
1	B
2	B
3	B
4	B
5	B
6	A
7	A
8	B
9	C
10	B

### Question 11a.

Marks	0	1	2	Average
%	8	65	27	1.2

- a measure/indicator of the hydronium ion concentration of a solution
- $-\log_{10}[\text{H}_3\text{O}^+]$  (this was also acceptable in words)

Answers that only referred to a measure of the acidity or alkalinity of a solution, with no mention of hydronium ions or the formula, were only given one mark.

### Questions 11b–c.

Marks	0	1	2	Average
%	8	8	85	1.8

11b.

basic

11c.

7.00, 7, seven and neutral were all acceptable answers.

### Question 12

Marks	0	1	2	3	4	Average
%	0	12	42	31	15	2.5

# 2005 Assessment Report



**12a.**  
analytical balance

**12b.**  
Adding the glucose to one litre may increase the total volume to more than one litre.

**12c.**

- the concentrations of glucose will vary throughout the solution
- errors will occur because of improper mixing

### Questions 13a–b.

Marks	0	1	2	3	4	5	Average
%	69	4	4	8	0	15	1.1

**13a.**  
0.05 mole

Calculations that correctly used  $n = C \times V$  but which contained mathematical errors were granted partial marks.

**13b.**  
2.922 g

Calculations that correctly used  $n = \frac{m}{MW}$  but which contained mathematical errors were granted partial marks.

### Questions 13c–e.

Marks	0	1	2	3	Average
%	0	0	77	23	2.3

**13c.**  
volumetric or standard flask

**13d.**  
analytical reagent

**13e.**  
MSDS, material safety data sheet, safety data sheet, or similar responses were accepted.

### Question 14

Marks	0	1	2	3	4	Average
%	0	4	15	19	62	3.4

Hazard category	Material/Item
dangerous goods flammable class	ethanol
radiation hazard	
dangerous goods explosive class	dry picric acid
electrical hazard	
physical hazard	a working steam autoclave
dangerous goods corrosive class	a concentrated sodium hydroxide solution
toxic substance	a concentrated sodium hydroxide solution
biohazard	a bacterial culture plate with colonies