



2006 VCE VET Laboratory Skills GA 2: Written examination

GENERAL COMMENTS

VCE VET Laboratory Skills is one of the smaller VCE VET programs offered, with only 10 students sitting the exam in 2006; therefore it was difficult to establish any trends in students' responses to the examination paper. Generally the questions were answered well and the students had a clear understanding of what was required.

Once again a small number of students did not read the instructions correctly and answered all three electives instead of just the required two. Teachers should remind students throughout the year that they must complete only the electives that they have covered during the year. Students generally performed well on the multiple-choice sections of the paper. In the short answer sections, skills in calculation and the use of formulas were not well developed. In elective 3, the safety questions were answered well.

SPECIFIC INFORMATION

Section 1 – Core Units

Multiple-choice

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

Question 11a.

Marks	0	1	2	Average
%	0	10	90	1.9

Possible responses included:

- name
- dates
- calibration data
- results
- faults/problems
- hours of use.

This question was answered well by all students.

Question 11b.

Marks	0	1	2	Average
%	55	35	10	0.6

Possible responses included:

- due to an increase in the amount of testing
- the results may be out of range
- change in methods/reagent
- move equipment
- power interruption.

A more careful reading of the question is required. The question did not ask when balances should be calibrated; it asked when the frequency of calibration might be increased.

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Question 11c.

Marks	0	1	2	3	Average
%	5	20	50	25	2.0

Possible responses included:

- standard weights
- tare weight
- levelling.

This question was generally well done.

Question 12

Marks	0	1	2	3	4	Average
%	0	35	30	20	15	2.2

Work team

- A small group that usually consists of two to five people who have a reason for working together.
- Members depend on each other to complete a set task or reach a common goal.

Work group

- Any number of people who work in the same department or location.
- Can be divided into a number of work teams and have a number of specific projects.

A number of students had difficulty with the differences between work teams and work groups.

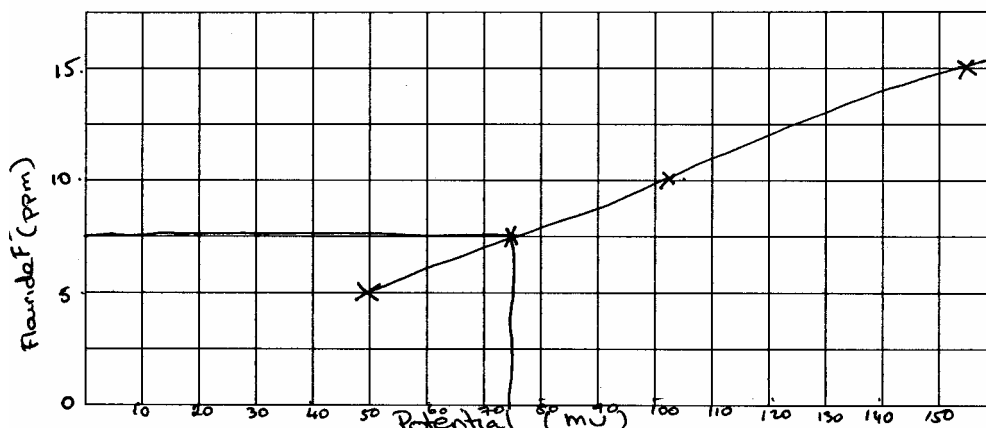
Question 13

Marks	0	1	2	3	Average
%	0	25	50	25	2.0

Mandy needs to discuss her problems openly with her supervisors and members of the two work teams. She needs to negotiate specific responsibilities which she can complete for the two teams. She needs to set priorities and communicate them so that the two teams can work together to reach their goals.

Question 14a.

Marks	0	1	2	3	Average
%	10	10	35	45	2.2



A number of students failed to draw the curve, there were no interpolation lines or units were not included on the axis.

Question 14b.

Marks	0	1	Average
%	25	75	0.8

7.5 ppm (+/- 0.5 ppm)

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Question 14c.

Marks	0	1	2	Average
%	20	35	45	1.3

Possible responses included:

- not calibrating the instrument properly
- incorrect weighting of standards
- not having the instrument properly immersed in solution
- not correctly cleaning/rinsing the test container
- solution contaminated.

Section 2 – Electives

Elective 1 – PMLTEST300A Perform basic tests

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

Students did not handle Question 4, on the definition of melting point, very well. The melting point is the temperature at which all the solid turns to liquid.

Question 11a.

Marks	0	1	Average
%	33	67	0.7

Viscosity is a measure of the resistance of a fluid to deformation under shear stress. It is commonly perceived as 'thickness', or resistance to pouring. Viscosity describes a fluid's internal resistance to flow and may be thought of as a measure of fluid friction. Thus, methanol is 'thin', having a low viscosity, while vegetable oil is 'thick', having a high viscosity.

Question 11b.

Marks	0	1	2	Average
%	39	33	28	0.9

High viscosity

- oil
- honey
- treacle
- glue
- paint
- glycerol

Low viscosity

- water
- aqueous solutions
- saline
- juice
- alcohol
- PBS

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Viscosity is one of the properties measured in basic tests. It appears that a number of students did not understand viscosity. This topic should be covered in more detail in the future.

Question 11c.

Marks	0	1	2	3	4	Average
%	67	17	6	6	6	0.7

Possible responses included:

- motor oil – so it lubricates properly
- paint – so it does not run off the brush but can be spread evenly
- vegetable oils and margarine – so they have the required properties.

Students needed to provide two examples and explain why viscosity properties are important for each in order to receive full marks.

Question 11d.

Marks	0	1	2	3	Average
%	28	6	11	56	2.0

Possible responses included:

- temperature
- pressure
- calibration.

Question 11 was not well answered and it was obvious that some students had not studied viscosity. Some students understood the definitions but had difficulty applying their knowledge.

Question 12a.

Marks	0	1	2	Average
%	11	22	67	1.6

Flammable liquid cabinet	Corrosive store	Oxidiser store
70% alcohol	sodium hydroxide	

This question was well answered by students.

Question 12b.

Marks	0	1	2	Average
%	11	78	11	1.0

Dilute with plenty of water and wash down the sink	Neutralise the solution and flush down the sink	Organic waste container
	sodium hydroxide	70% alcohol

Question 12c.

Marks	0	1	2	3	Average
%	11	0	11	78	2.6

Possible responses included:

- chemical name
- chemical formulae
- concentration of chemical
- preparation or expiry date
- risk or safety phrases
- dangerous goods labels
- technician's name.

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Question 12d.

Marks	0	1	2	3	Average
%	17	17	28	39	1.9

Possible responses included the following.

Stored

- if the chemicals are likely to be used regularly they should be stored
- reduces waste
- is a more sustainable option
- saves preparation time
- saves money
- long shelf life

Disposed

- solutions may have been contaminated during experiment
- minimum quantities of chemicals should be kept in the laboratory
- storage containers can be washed and reused so less containers need to be purchased
- solutions take up storage space
- excess chemicals increase hazards in the laboratory

Students should be aware that disposal of ethanol down the sink is not recommended.

Elective 2 – PMLTEST301A Perform laboratory biological procedures

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

Question 6 was not well answered – very few students considered eliminating the hazard, which is always the preferred option if possible.

Question 11

Marks	0	1	2	3	4	Average
%	17	33	17	33	0	1.7

Possible responses included:

- lenses should be carefully cleaned using lens tissue as these do not scratch the surface
- never adjust the stage while looking down the microscope
- ensure slides and counting chamber bases are dry before putting them on the stage
- clean oil off immersion objectives immediately after use
- support the microscope from underneath, do not move it by just holding the stand
- handle gently
- cover when not in use
- do not dismantle the microscope (this must be done by properly trained technicians).

Question 12a.

Marks	0	1	2	3	Average
%	0	0	0	100	3.0

Possible responses included:

- gowns

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- rubber gloves
- safety glasses
- face shields
- enclosed shoes
- heat gloves.

All students received full marks for this question.

Question 12b.

Marks	0	1	2	3	Average
%	17	33	33	17	1.5

Possible responses included:

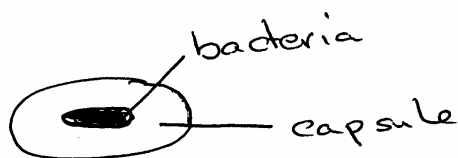
- correct fit/size
- suitable for the hazard
- comply with relevant standards
- used correctly
- users properly trained in the use
- properly maintained.

A number of students focussed on the use of personal protective equipment (PPE) rather than prevention of damage.

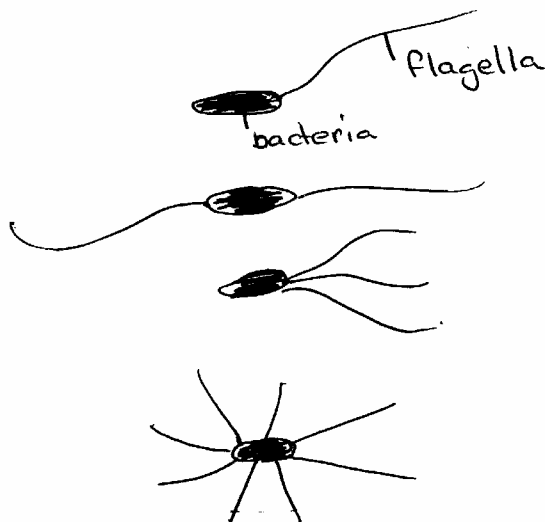
Question 13

Marks	0	1	2	3	Average
%	33	33	0	33	1.4

13i. capsule



13ii. flagella

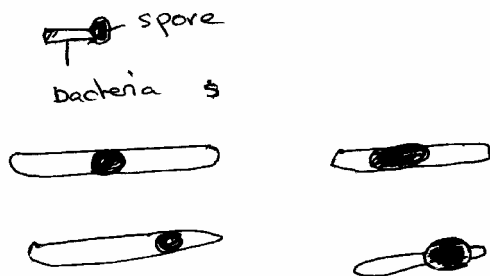


Any of these diagrams would be correct as flagella are found in a number of different configurations.

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13iii. spore



Any of the above were correct as spores can be found in different cell locations and may be round or oval.

A number of students could not draw the bacterial structures requested.

Question 14

Marks	0	1	2	3	4	Average
%	33	33	33	0	0	1.0

Possible responses included:

- place wax sections onto a warm water bath (at least 40°C)
- allow sections to become flat and fully expanded
- dip slide obliquely into water as close as possible to the section
- remove slide complete with section from the water
- position section using a needle
- drain excess water
- label slide
- transfer slide to an incubator or hotplate at 45–50°C for an hour to ensure proper drying.

This question was not answered well as many students did not have histology knowledge. Although many schools do not have the necessary equipment, a number of books are available.

Question 15a–c.

Marks	0	1	2	3	Average
%	33	0	67	0	1.4

Question 15a.

They have no nucleus.

Question 15b.

To carry oxygen around the body.

Question 15c.



A number of students did not draw a cross section as asked.

Elective 3 – PMLTEST303 Prepare working solutions

Question	Correct Response
1	B
2	C
3	B
4	B
5	A

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6	C
7	B
8	A
9	C
10	C

Question 11a.

Marks	0	1	2	Average
%	31	44	25	1.0

Possible responses included:

- calculate the weight of anhydrous substance required
- consult her supervisor
- measure the volume.

Question 11b.

Marks	0	1	2	3	Average
%	19	19	6	56	2.0

$$\begin{aligned} n \text{ mole} &= C \times V/L \\ &= 0.25 \text{ mole} \end{aligned}$$

As in previous papers, students are still having problems with stoichiometry. As this is a basic requirement for this unit, more class time should be spent on this topic and on balancing equations.

Question 11c.

Marks	0	1	2	3	Average
%	31	19	0	50	1.7

$$\begin{aligned} \text{mass} &= n \text{ mole} \times \text{formulae mass} \\ &= 0.25 \times 159.61 \\ &= 39.90 \text{ m} \end{aligned}$$

Question 11d.

Marks	0	1	2	3	Average
%	0	13	44	44	2.3

Possible responses included:

- appropriate risk and safety phrases
- batch number
- Australian contact details
- purity
- storage conditions
- first aid.

Most students handled this question well.

Question 12a.

Marks	0	1	2	Average
%	56	0	44	0.9

$$\begin{aligned} C_1V_1 &= C_2V_2 \\ 0.5 \times x &= \frac{0.5 \times 250}{5} \\ &= 25\text{ml} \end{aligned}$$

Students experienced problems with the standardisation of solutions. Students need to do more work with equations and calculating volumes of solutions.

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Question 12b.

Marks	0	1	2	3	Average
%	13	25	50	13	1.7

- pipette
- volumetric flask
- measuring cylinder

Questions 12c.

Marks	0	1	2	Average
%	0	63	38	1.4

Possible responses included:

- ensure the chemical has completely dissolved
- ensure the solution is properly mixed
- ensure the pH meter is properly calibrated.

Question 12d.

Marks	0	1	Average
%	0	100	1.0

Material Safety Data Sheet (MSDS)

This question was answered well by all students.

Question 12e.

Marks	0	1	Average
%	0	100	1.0

On the label

This question was answered well by all students.