

# 2017 VCE VET Engineering Studies examination report

## General comments

Students performed well in the 2017 VCE VET Engineering Studies examination, with the majority of students attempting most questions.

The areas that students handled most confidently were environmental sustainability and handling engineering materials.

In questions relating to engineering drawings, isometric drawing was handled reasonably well; however, a large percentage of students did not properly understand the fundamentals of third-angle orthogonal drawings.

Overall, students need to focus more on reading and understanding the question before answering, as some answers given did not relate to the question asked.

## Specific information

This report provides sample answers or an indication of what answers may have included. Unless otherwise stated, these are not intended to be exemplary or complete responses.

The statistics in this report may be subject to rounding resulting in a total more or less than 100 per cent.

## Section A – Multiple-choice questions

The table below indicates the percentage of students who chose each option. The correct answer is indicated by shading.

Question	% A	% B	% C	% D	Comments
1	95	1	1	3	
2	5	4	90	1	
3	3	18	6	73	
4	32	1	0	67	
5	1	74	0	24	
6	3	75	5	17	
7	98	0	1	1	
8	24	26	28	20	Students who selected option A calculated rectangles not triangles, and students who selected option B calculated using a different orientation of the sheet.
9	53	1	43	3	The majority of students chose option A and related red tagging to safety lockout tags, but the question referred to 5S.

Question	% A	% B	% C	% D	Comments
10	1	19	15	65	
11	61	20	12	8	
12	13	48	11	27	Option B was correct because it gives the person a clear view of the end of the steel tube. Option D has the steel potentially hitting high obstacles such as the fan or lighting.
13	5	93	0	1	
14	81	17	2	0	
15	69	15	3	13	
16	20	57	10	13	
17	4	3	33	60	
18	13	59	13	15	
19	13	25	56	6	
20	5	8	44	43	Many students chose option D, third-angle projection, but the drawing was drawn in first-angle projection (option C).

## Section B

### Question 1

Marks	0	1	2	3	Average
%	6	18	39	37	2.1

Acceptable answers included:

- weight of object – can it be lifted alone?
- physical size/shape
- stability of load
- sharp edges
- is pathway clear?
- how far it needs to be moved
- how long the task is performed for.

Overall, this question was answered well by most students.

### Question 2

Marks	0	1	2	Average
%	15	38	47	1.3

The following two (or similar) answers were accepted:

- condition (not frayed, etc.)
- load rating (SWL).

Some students gave general answers for lifting that did not relate to the sling.

**Question 3a.**

<b>Marks</b>	<b>0</b>	<b>1</b>	<b>Average</b>
<b>%</b>	10	90	

Acceptable answers included:

- handling sharp objects
- welding
- handling hot objects
- using chemicals.

**Question 3b.**

<b>Marks</b>	<b>0</b>	<b>1</b>	<b>Average</b>
<b>%</b>	14	86	

Acceptable answers included:

- lathe
- drilling
- using pedestal grinder
- near rotating machinery.

This question was answered well by most students.

**Question 4a.**

<b>Marks</b>	<b>0</b>	<b>1</b>	<b>Average</b>
<b>%</b>	4	96	

Acceptable answers included:

- forklift
- crane.

**Question 4b.**

<b>Marks</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>Average</b>
<b>%</b>	12	46	43	

Acceptable answers included:

- age of person lifting
- number of times a person needs to lift the weight (repetition)
- posture/incorrect lifting technique
- stability of load
- position/height of object
- duration of lift
- work area design
- size and shape.

Some students gave generic answers around correct lifting technique that did not address the question.

**Question 5**

Marks	0	1	2	Average
%	43	23	34	<b>0.9</b>

Acceptable answers included:

- what is to be cleaned
- how often/when it should be cleaned
- who is responsible
- sign-off from supervisor
- confirmation that each item has been completed
- cleaning standards.

Answers given by the majority of students indicated that they did not fully understand what a 5S cleaning schedule was.

**Question 6a.**

Marks	0	1	Average
%	25	75	<b>0.8</b>

Acceptable answers included:

- less landfill
- reduced greenhouse gases
- reduced consumption of natural resources.

This question was answered well by the majority of students.

**Question 6b.**

Marks	0	1	Average
%	14	86	<b>0.9</b>

Acceptable answers included:

- reduced costs
- improved public image
- adhere to legislation.

**Question 7**

Marks	0	1	2	Average
%	5	47	48	<b>1.5</b>

Acceptable answers included:

- metals such as steel/aluminium/brass
- pallets
- cardboard boxes
- swarf.

**Question 8**

Marks	0	1	2	Average
%	2	34	64	1.6

Acceptable answers included:

- paper
- printer cartridges
- electronic equipment
- cardboard boxes
- milk cartons
- batteries.

**Question 9**

Marks	0	1	2	3	Average
%	1	8	22	69	2.6

- recover
- reduce
- reuse

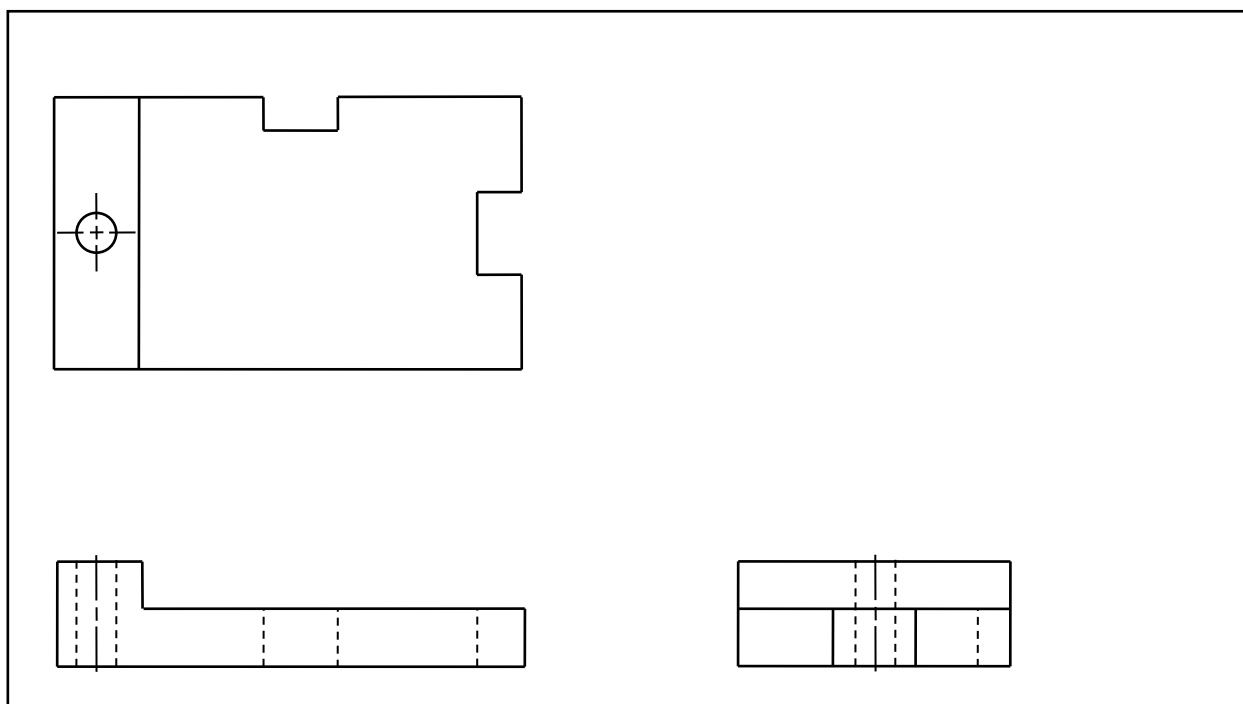
**Question 10**

Marks	0	1	Average
%	17	83	0.9

1200 RPM

**Question 11**

Marks	0	1	2	3	4	5	6	Average
%	4	3	11	18	26	25	14	3.9



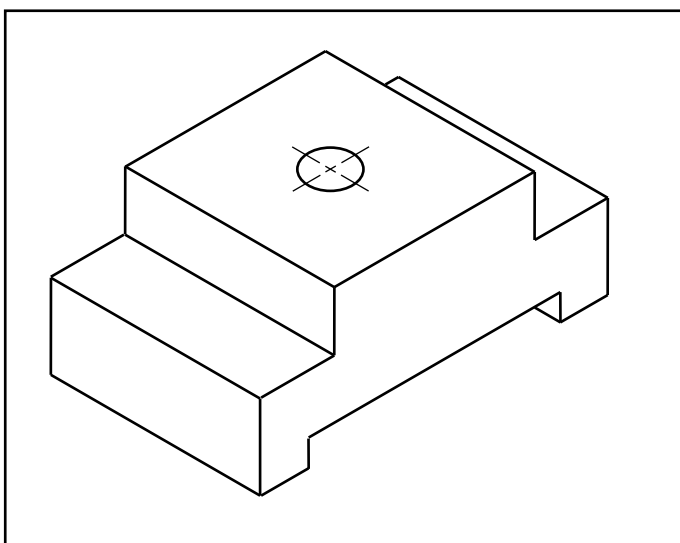
Marks were awarded for:

- correct views/third-angle projection
- hidden lines
- centre lines.

Only a small number of students achieved full marks for this question. Students struggled to get the three views in the correct third angle.

**Question 12**

Marks	0	1	2	3	4	5	Average
%	19	3	9	11	26	32	3.2



Marks were awarded for:

- correct shape
- correct isometric
- centre line on hole.

This question was attempted by the majority of students, with most achieving good marks.

**Question 13a.**

Marks	0	1	Average
%	27	73	0.7

Acceptable answers included:

- ownership/involvement
- get better ideas
- everyone can contribute to ideas.

**Question 13b.**

Marks	0	1	Average
%	8	92	0.9

Sort

**Question 13c.**

Marks	0	1	2	Average
%	9	64	27	1.2

Acceptable answers included:

- takes up space
- will become a place for storing junk.

**Question 13d.**

Marks	0	1	Average
%	31	69	0.7

Set in order

**Question 13e.**

Marks	0	1	2	Average
%	6	37	57	1.5

Acceptable answers included:

- know where items belong
- know if anything is missing
- easy to find items.

**Question 13f.**

Marks	0	1	2	Average
%	6	23	71	1.7

Acceptable answers included:

- shadows/outlines
- photo of item
- label
- colour coding.

**Question 13g.**

Marks	0	1	Average
%	13	87	0.9

Acceptable answers included:

- less time searching for tools
- less walking – what you need is closer
- improves work efficiency.

**Question 14**

Marks	0	1	2	Average
%	21	33	46	1.3

- shape A

- dimensioned from datum/do not get accumulative error

Many students did not appear to understand the concept of dimensioning from a datum.

**Question 15a.**

Marks	0	1	Average
%	36	64	0.7

Six pieces

**Question 15b.**

Marks	0	1	2	3	Average
%	47	11	6	37	1.3

10 frames require:

$20 \times 780 \text{ mm} + 40 \times 350 \text{ mm}$

Every 6 m length will get  $4 \times 780 \text{ mm} + 8 \times 350 \text{ mm}$

Five lengths required.

Many students failed to calculate correctly.

**Question 15c.**

Marks	0	1	2	Average
%	29	44	27	1

Acceptable answers included:

- use gloves
- clamp down when cutting
- support the end not being cut.

The majority of students did not properly describe safe handling/cutting.

**Question 16**

Marks	0	1	2	Average
%	42	32	26	0.9

Any two of the following:

- water
- land/soil
- noise

Most students did not achieve full marks, indicating a lack of basic understanding of the Victorian *Environmental Protection Act*.

**Question 17**

Marks	0	1	Average
%	2	98	1

Do not recycle or material not recyclable



**Question 18**

Marks	0	1	2	3	4	Average
%	50	17	11	5	17	1.2

Hole: circumference =  $\pi \times D$

$$3.14 \times 200 = 628$$

Angles:  $\sqrt{200^2 + 200^2} = \sqrt{80\,000} = 283$

Total =  $628 + 283 + 283 + 600 + 400 + 200 + 400 = 2794$  mm

Most students did not appear to understand how to calculate the circumference and hypotenuse of triangles.

**Question 19**

Marks	0	1	2	Average
%	8	33	59	1.5

Acceptable answers included:

- safer work area
- less walking/searching
- makes work easier
- less frustration.

**Question 20**

Marks	0	1	2	3	Average
%	26	6	11	57	2

146 cm<sup>2</sup>

This question was attempted by the majority of students, with many achieving full marks.

**Question 21a.**

Marks	0	1	Average
%	16	84	0.9

Power/electricity

**Question 21b.**

Marks	0	1	Average
%	27	73	0.8

\$150 000

**Question 22a.**

Marks	0	1	Average
%	22	78	0.8

Acceptable answers included:

- cannot be recycled
- goes to landfill
- pollutes environment when manufactured
- toxic if burnt
- does not break down naturally.

**Question 22b.**

Marks	0	1	2	Average
%	18	16	66	1.5

Cardboard or shredded paper – material that can be recycled

The majority of students displayed a good understanding of recycling practices.

**Question 23**

Marks	0	1	Average
%	29	71	0.7

Noise or sound

**Question 24a.**

Marks	0	1	2	Average
%	6	28	66	1.6

Acceptable answers included:

- know what the product is
- understand risks with using product
- know how to use it correctly
- know how to store it correctly.

**Question 24b.**

Marks	0	1	2	Average
%	4	19	77	1.7

A – flammable

B – corrosive

C – toxic to aquatic life

D – dangerous if swallowed

**Question 24c.**

Marks	0	1	Average
%	42	58	0.6

All the following were required for full marks:

- gloves
- protective clothing
- eye/face protection.

The majority of students answered this question well, but some did not give all PPE required.

**Question 24d.**

Marks	0	1	Average
%	20	80	<b>0.8</b>

Acceptable answers included:

- locked up
- dry place
- closed container
- well ventilated.

**Question 25**

Marks	0	1	Average
%	49	51	<b>0.5</b>

0.8 litres

Some students struggled to work out correct ratio.

**Question 26**

Marks	0	1	2	3	4	Average
%	7	12	18	30	33	<b>2.7</b>

Acceptable answers included:

- hold regular 5S meetings
- put in a system for collecting 5S improvement ideas
- put in a system for emptying rubbish bins
- create a map to show where each person is responsible for cleaning
- mark locations of bins and trolleys on floor
- mark locations of aisles and walkways.

This question was attempted by the majority of students; however, some students simply gave the issues straight from the audit, rather than turning the issues into reasonable actions.