



GENERAL COMMENTS

A breakdown of the student responses to the 2012 VCE VET Engineering Studies examination paper shows the following.

- Section A: There was an improvement in the average number of correct responses to this section compared with previous years.
- Section B: Sketching and drawing interpretation continued to improve this year. In particular, the isometric sketch was drawn very well by the majority of students.
- Section C: While there was some improvement this year, students continued to struggle with basic operational planning.
- Section D: As in previous years, this section was answered well, with most students showing a good understanding of safety in the workplace.
- Section E: There was an improvement in the number of students attempting all the questions in this section. Students had the most difficulty with questions related to setting up and work-holding.

As in previous years, in the short-answer section of the paper the following general approaches were followed when allocating marks.

- To gain marks, responses needed to be consistent with the level of knowledge expected of a trainee in the engineering industry at a Certificate II standard.
- If a question required one response and the student gave more than one response, the answer was accepted, provided that all the responses were correct and did not contradict each other. However, if students give more than one response and include an answer that is incorrect, they cannot be awarded any marks. Students are more likely to be awarded marks for short, concise answers that are appropriate to the question, rather than giving a ‘range’ of responses.
- If a response did not address the subject of a question it was not given any marks.

SPECIFIC INFORMATION

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

Section A – VBN 771 Apply electrotechnology principles in an engineering work environment

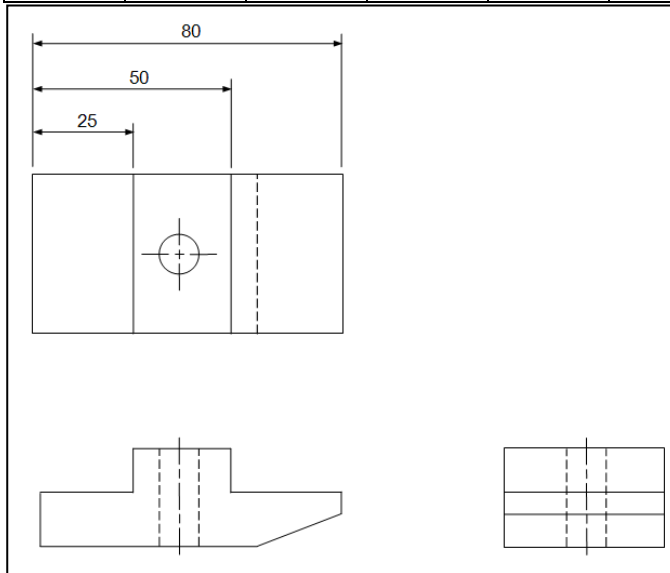
Question	% A	% B	% C	% D	Comments
1	7	82	9	1	
2	25	42	9	24	A watt is a unit of electrical energy; therefore, wattmeter (option D) was correct. Voltage is a measure of electrical potential.
3	68	4	25	3	
4	6	2	85	8	
5	48	30	6	15	
6	9	8	75	8	
7	6	14	63	16	
8	8	74	9	9	
9	13	14	52	21	Figure 2 was wired in parallel, so the voltage drop is equal. Students may have mistaken Figure 2 for a series circuit or they may have been unfamiliar with the basic differences between parallel and series circuits.
10	3	48	14	35	
11	1	2	40	57	
12	44	1	37	18	
13	3	3	79	14	
14	25	66	3	6	
15	5	76	11	7	



Section B – VBN 773 Produce basic engineering sketches and drawings

Question 1

Marks	0	1	2	3	4	5	6	Average
%	8	10	15	17	18	22	10	3.3



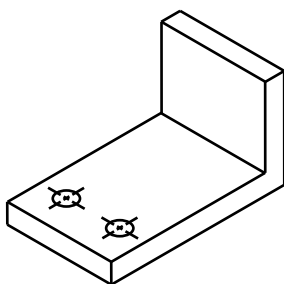
Marks were allocated for

- correct views in third-angle projection
- three dimensions from the datum
- correct centre lines and hidden detail.

Overall sketching showing the three views was good; however, basic placement of dimensions and correct centre lines are areas that could use some improvement.

Question 2

Marks	0	1	2	3	Average
%	12	3	9	76	2.5



Marks were allocated for

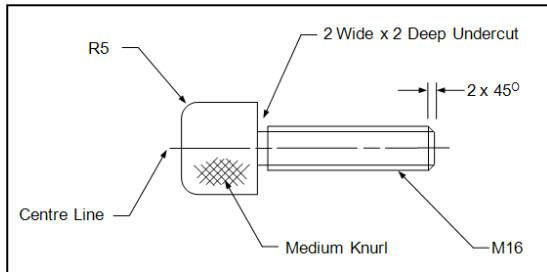
- correct shape of the bracket
- correct isometric representation.

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Question 3

Marks	0	1	2	3	Average
%	11	14	35	39	2.0



Question 4

Marks	0	1	2	3	Average
%	2	3	38	57	2.5

4a.

maximum: 18.1 mm

minimum 18.0 mm

4b.

C

4c.

B

Section C – VBN 776 Use basic engineering concepts to plan the manufacture of engineering components

Question 1a.

Marks	0	1	Average
%	5	95	1.0

282 mm

Question 1b.

Marks	0	1	2	Average
%	37	46	17	0.8

Any two of

- use a milling machine
- use a file
- face off in a lathe using a 4-jaw chuck.

Question 1c.

Marks	0	1	2	Average
%	1	7	92	1.9

- scriber
- centre punch
- rule
- hammer

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Question 2a.

Marks	0	1	2	Average
%	14	30	57	1.5

Any four of

- turning tool
- centre drill
- knurling tool
- parting tool
- micrometer
- vernier caliper
- rule.

Question 2b.

Marks	0	1	2	3	4	5	Average
%	21	8	13	19	19	20	2.7

Step	Operation
1	Face and centre drill bar
2	Re-position 120 mm out of chuck and support with live centre
3	Turn Ø18
4	Knurl Ø18
5	Turn Ø12 and chamfer
6	Part off
7	Face to length and chamfer

Question 3

Marks	0	1	2	3	Average
%	12	27	40	21	1.7

3a.

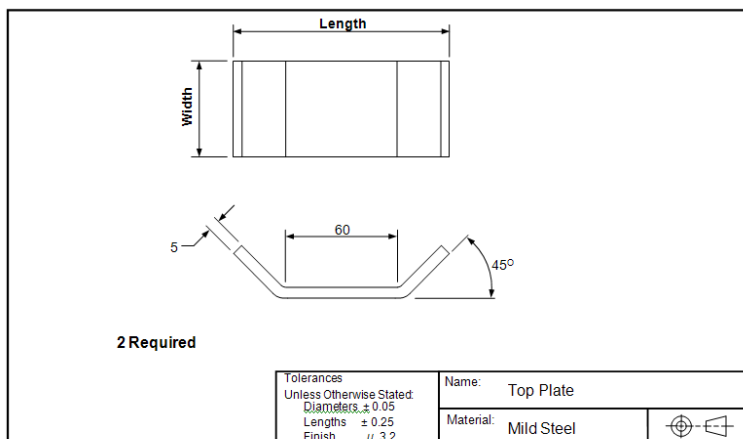


Figure 4

3b.

Either of

- heat and bend in a vice with a hammer
- use a hydraulic press.

Other similar answers were also accepted.

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Section D – VBN 777 Handle engineering materials

Question 1

Marks	0	1	2	3	Average
%	2	13	39	46	2.3

1a.

A

1b.

F

1c.

The PPE must be worn correctly.

Other similar answers were also accepted.

Question 2

Marks	0	1	2	Average
%	0	2	98	2.0

Any two of

- safety glasses/face shield
- gloves
- apron.

Question 3

Marks	0	1	2	Average
%	33	24	43	1.1

Any two items found in the MSDS, typically the

- storage of the product
- procedures for dealing with spills
- first aid procedures
- flash point of the product.

Question 4

Marks	0	1	2	3	Average
%	1	5	1	93	2.9

4a.

3

4b.

1

4c.

2

Question 5

Marks	0	1	2	Average
%	6	20	74	1.7

He could (any two of)

- break a leg or arm if he fell off the stool
- hurt his back from lifting incorrectly
- get bruised if the box fell on him.

Other similar answers were also accepted.

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Question 6

Marks	0	1	Average
%	22	78	0.8

The person working at the bench could be hit by the pipe.

Question 7

Marks	0	1	2	Average
%	10	56	34	1.3

Any two of

- bending/reaching over to lift the metal plate
- handling sharp steel with bare hands
- bending over machinery/equipment.

Other similar answers were also accepted.

Section E – VBN 778 Produce basic engineering components and products using fabrication and machining

Questions 1a–c.

Marks	0	1	2	3	Average
%	4	20	50	26	2.0

1a.

16 Gauge Mild Steel

1b.

650 × 450 mm

1c.

Either of

- use an engineer's square
- measure across diagonal corners.

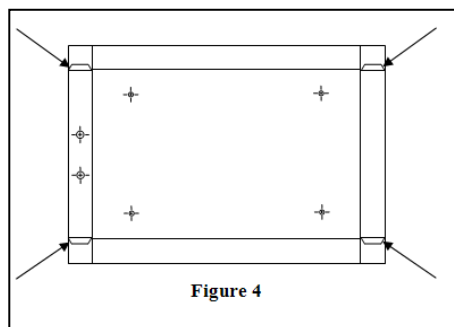
Question 1d.

Marks	0	1	2	Average
%	23	44	33	1.1

1di.

protractor

1dii.



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Question 1e.

Marks	0	1	2	Average
%	23	57	20	1.0

Any two of

- cut with a hacksaw
- cut with a bandsaw
- use tin snips.

Question 1f.

Marks	0	1	2	3	Average
%	2	4	19	76	2.7

Any three of

- spot welded
- riveted
- welded
- with an adhesive
- with screws
- with nuts and bolts.

Question 2a.

Marks	0	1	Average
%	16	84	0.9

D

Questions 2b–g.

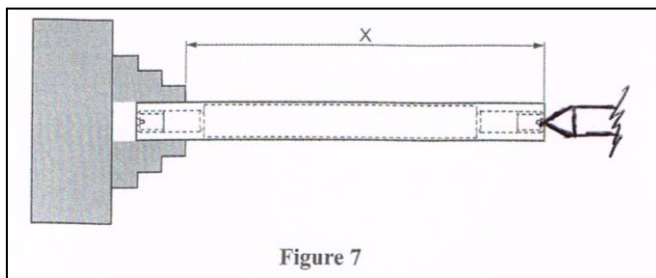
Marks	0	1	2	3	4	5	6	7	Average
%	7	9	14	19	16	18	13	4	3.5

2b.

three-jaw chuck

2c.

Students needed to sketch the end being supported by the centre.



2d.

Any distance between 426 – 460 mm was accepted.

2e.

held between two centres

2f.

$$\text{rpm} = \frac{320 \times 35}{25} = \frac{11200}{25} = \boxed{448 \text{ rpm}}$$

2g.

55 mm

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Question 2h.

Marks	0	1	2	3	Average
%	45	39	13	3	0.8

2hi.

B

2hii.

The angle of the tool allows for turning the diameter and facing the corner in the same set up.

2hiii.

The tool post

Questions 2i–m.

Marks	0	1	2	3	4	5	6	7	8	Average
%	10	11	15	18	16	14	9	6	2	3.4

2i.

Any two of

- grind the nose radius on the tool
- reduce the feed rate
- use coolant
- change the rpm
- increase the rigidity of the set up.

2j.

a die

2k.

Either of

- end mill
- face mill.

2l.

Any of

- hold in a vice on parallel strips
- hold on matching vee blocks
- clamp directly to the milling machine table on the 'T' slot.

2m.

Because it (both of)

- is more accurate
- saves time.

Questions 3a–b.

Marks	0	1	2	Average
%	14	40	46	1.3

3a.

The blade is on backwards.

3b.

Weld on both sides.

Questions 3c–e.

Marks	0	1	2	3	Average
%	33	36	19	12	1.1

3c.

dividers

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3d.

Remove the bulk of material from the corners by hacksawing (or grinding), and file the radius to shape.

3e.

Answers between 15 – 30 mm were accepted.

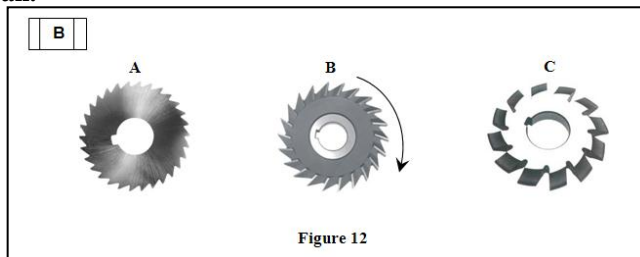
Question 4a.

Marks	0	1	2	Average
%	11	45	44	1.4

4ai.

B

4a.ii.



The arrow needed to be drawn in a clockwise direction.

Question 4b.

Marks	0	1	Average
%	89	11	0.1

Either of

- in a vice with a ‘Vee’ in the jaw
- clamped in a vee block.

Question 5

Marks	0	1	2	3	Average
%	23	26	24	27	1.5

5a.

The nut will come loose or tighten and stop the wheel from rotating.

5b.

Any two of

- Nyloc Nut
- washer and split pin
- tab washer on nut
- two nuts locked against each other.

Loctite was also accepted.