VICTORIAN CURRICULUM AND ASSESSMENT AUTHORITY

2009 VCE VET Engineering Studies Certificate III GA 2: Examination

GENERAL COMMENTS

The number of students who sat the 2009 Engineering Certificate III examination was very low. Because Sections A and B were the same as for the Certificate II exam, the comments for these two sections also reflect the Certificate II student responses.

Student performance on Section B – Reading and interpreting drawings had improved from previous years. Sketching to conventional drawing systems (that is, correct views and dimensioning) continues to be a weak point for students.

In the short answer section of the paper the following general approaches were followed in allocating marks.

- To gain marks, responses needed to be consistent with the level of knowledge expected of a trainee in the engineering industry at Certificate III standard.
- If a response did not address the subject of a question it was not given any marks.

SPECIFIC INFORMATION

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

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	0	0	13	88	Students may have confused open circuit conditions with closed circuit conditions. Option B, the total supply voltage, would have been correct for open circuit conditions.
2	13	88	0	0	
3	25	75	0	0	
4	0	0	88	13	
5	13	13	50	25	
6	0	0	13	88	The question asked for a factor which does not effect resistance; however, students may have chosen a factor which does effect resistance.
7	25	50	0	25	
8	13	0	50	38	
9	63	0	25	13	
10	13	75	0	13	
11	13	13	25	50	Students may have lacked understanding of the purpose of a safety switch, believing that it does exactly the same job as a fuse. A fuse will blow if a circuit is overloaded, but safety switches work on current leakage.
12	13	25	13	50	
13	0	0	0	100	
14	13	88	0	0	
15	63	25	13	0	

Section B – VBN 773 Produce engineering sketches and drawings

Question 1

Marks	0	1	2	3	4	Average
%	13	38	13	13	25	2

Marks were allocated for:

- all necessary dimensions shown
- correct end view in third angle projection
- correct centre lines shown
- hidden detail correctly shown.

Common issues with this question included the incorrect view being drawn and over-dimensioning.

Question 2a–e.

Marks	0	1	2	3	4	5	6	7	Average
%	0	0	13	13	0	38	13	25	**5**

2a.
Countersink diameter 8 (countersink was also accepted)

2b.
1.5 mm

2c.
18 mm

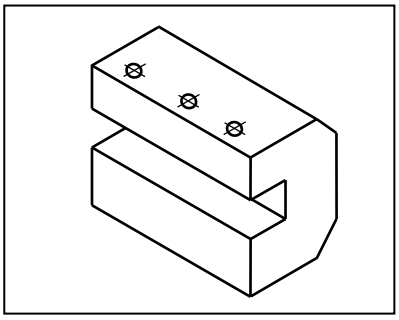
2d.
Maximum 100.25/minimum 99.75

2e.

Type of Material	MS or mild steel
Material Size	Ø16 x 103

Question 3

Marks	0	1	2	3	4	Average
%	25	13	38	0	25	**1.9**



Marks were allocated for:

- correct shape
- holes shown in the correct position
- all outlines complete
- isometric accuracy.

Section C – VBN 787 Apply mathematical principles to engineering designs

Question 1

Marks	0	1	2	Average
%	38	13	50	**1.2**

67%

Question 2

Marks	0	1	2	Average
%	88	0	13	**0.3**

0.393

Question 3

Marks	0	1	Average
%	13	88	**0.9**

¼

Question 4

Marks	0	1	2	Average
%	25	13	63	**1.4**

367.8

Question 5

Marks	0	1	2	Average
%	38	0	63	**1.3**

3.52 mm^2

Question 6a.

Marks	0	1	2	Average
%	13	0	88	**1.8**

460

Question 6b.

Marks	0	1	Average
%	13	88	**0.9**

163.2

Question 7

Marks	0	1	2	3	Average
%	75	25	0	0	**0.3**

2.01 m^2

Question 8

Marks	0	1	2	Average
%	63	0	38	**0.8**

56.57 mm

Question 9a.

Marks	0	1	2	Average
%	63	13	25	**0.7**

183.9 m^2

Question 9b.

Marks	0	1	2	Average
%	50	13	38	**0.9**

18.39 m^3

Question 10

Marks	0	1	2	3	Average
%	50	0	0	50	**1.5**

2° 15’

Question 11

Marks	0	1	2	Average
%	25	50	25	**1**

10.5 mm

Question 12

Marks	0	1	2	3	4	Average
%	38	13	0	13	38	2

HOLE	X	Y
'A'	15.858	44.142
'B'	47.320	20.0

Section D – VBN 788 Design and prototype components and/or small structures using engineering design principles

There were several questions in Section D where students performed poorly. Most were general mechanical aptitude and basic tolerancing questions, which should be well within the understanding of a student at Certificate III level. Question 2c. (an operational planning question) was also a question students struggled with. Operational planning has always been a weak area for students, and it appears that they do not practise this skill on a regular basis.

Question 1

Marks	0	1	2	3	4	5	6	7	8	9	10	Average
%	0	13	25	0	0	38	0	0	25	0	0	4.5

Marks were allocated for:

- the overall functionality of the design
- design of adjustable length
- size of materials selected (strength and functionality)
- adequate labelling (description) of design.

Question 2a–b.

Marks	0	1	2	3	Average
%	38	44	13	6	0.9

2a.

Any two of (or similar):

- can be tightened without locking up
- nut will not come loose
- will not squash pipe when tightened.

2b.

Answers between 22.2 mm and 22.5 mm

Question 2c.

Marks	0	1	2	3	4	5	6	Average
%	25	50	13	0	0	13	0	1.4

Op. No.	Operation description	Work-holding method	Equipment/Cutters
1	Face off end	Three jaw chuck	Turning tool
2	Turn diameter 12	Three jaw chuck	Turning tool
3	Turn thread major diameter	Three jaw chuck	Turning tool

4	Cut thread	Three jaw chuck	M6 die Die holder
5	Part off	Three jaw chuck	Parting tool
6	Face to length and chamfer	Three jaw chuck	Turning tool

Question 2d.

Marks	0	1	2	Average
%	63	25	13	**0.5**

- less mechanical advantage
- more likely to bind/jam on column

Question 2e.

Marks	0	1	Average
%	50	50	**0.5**

Less mechanical advantage/harder to crush can

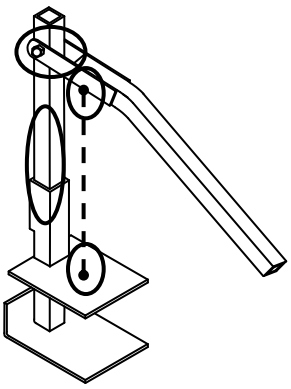
Question 2f.

Marks	0	1	Average
%	63	38	**0.4**

5 mm

Question 2g.

Marks	0	1	2	Average
%	38	25	38	**1**



Question 2h.

Marks	0	1	Average
%	69	31	**0.3**

Getting fingers caught in nip points

Question 2i.

Marks	0	1	Average
%	75	25	**0.3**

To allow the crusher plate to go all the way down the column

Question 2j.

Marks	0	1	2	Average
%	13	38	50	**1.4**

- bolt to the wall

- have a larger base

Question 3a.

Marks	0	1	2	3	4	5	6	Average
%	38	13	25	0	0	13	13	**2**

Marks were allocated for:

- overall functionality of design
- size of materials selected (strength and functionality)
- adequate labelling (description) of design.

Question 3b.

Marks	0	1	Average
%	100	0	**0**

Have three legs instead of four

Question 3c.

Marks	0	1	Average
%	44	56	**0.6**

For strength

Question 3d.

Marks	0	1	Average
%	100	0	**0**

To prevent the tube from being crushed when tightened

Question 3ei–ii.

Marks	0	1	2	Average
%	75	0	25	**0.5**

Option B. The other two options have a ‘plus’ tolerance which will not fit into the inside of the tube.