VICTORIAN CURRICULUM AND ASSESSMENT AUTHORITY

2009 VCE VET Engineering Studies Certificate II GA 2: Examination

GENERAL COMMENTS

Section A of the 2009 examination was handled well by the majority of students. Responses to Section B – Reading and interpreting drawings showed improvement on previous years' examinations. However, sketching to conventional drawing systems (that is, correct views and dimensioning) continues to be a weak point for some students.

It was clear from the operational planning part of Section C that a significant number of students do not understand the basic concepts of planning a job so that the sequence of operations is efficient and gives the accuracy required for the job. Most students' answers to Section D showed a good understanding of safety in the workplace. Overall, Section E was answered well. There were still a few areas where students experienced difficulty, including knowing the proper names of tools, reading measuring tools and basic RPM calculations.

As in previous years, 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 II standard.
- If a question required one response and the student gave more than one response, the answer was accepted provided the responses were correct and did not contradict each other. In general, it should be pointed out to students that they are more likely to be awarded marks for short, concise answers appropriate to the question. Students should avoid giving a 'range' of responses to a question.
- 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	13	7	8	72	
2	35	59	4	2	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.
3	38	48	5	8	
4	8	3	71	18	
5	11	15	51	23	
6	6	5	3	86	
7	37	36	7	20	The question asked for a factor which does not effect resistance; however, students may have chosen a factor which does effect resistance.
8	23	15	41	22	
9	59	17	17	7	
10	13	71	5	11	
11	13	9	28	50	
12	12	28	6	54	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.
13	1	0	0	99	
14	13	72	4	10	
15	72	13	13	2	

Section B – VBN 773 Produce engineering sketches and drawings

Question 1

Marks	0	1	2	3	4	Average
%	19	17	22	29	13	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
%	1	3	5	7	14	12	28	31	5.3

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

2b.
1.5 mm

2c.
18 mm

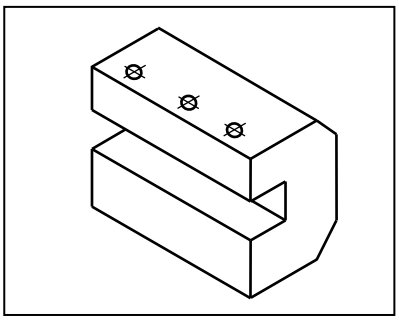
2d.
Maximum 100.25/minimum 99.75

2e.

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

Question 3

Marks	0	1	2	3	4	Average
%	21	8	7	31	34	2.5



Marks were allocated for:

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

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

Question 1a–b.

Marks	0	1	2	Average
%	13	32	54	**1.4**

1a.
C – Ø 32 mild steel

1b.
Three jaw chuck

1c.

Marks	0	1	2	3	4	Average
%	22	6	23	15	34	**1.4**

Sequence	Operation	Tools
1	face and centre	turning tool/centre drill
2	turn outside diameter	turning tool
3	knurl	knurling tool
4	drill hole	drill
5	tap thread	M16 tap, tap wrench
6	tart off	parting tool

A common error was students taking the component out of the lathe to drill the hole.

Question 2ai–ii.

Marks	0	1	2	Average
%	12	48	40	**1.3**

2ai.
93 mm

2aii.
To allow for facing off the ends

Question 2b.

Marks	0	1	Average
%	67	33	**0.4**

In a vee block

Question 2c–d.

Marks	0	1	2	3	Average
%	13	53	20	15	**1.4**

2c.
Touch the top of the screw with a height gauge, subtract half of the screw diameter from the reading, reset the height gauge to the new reading and mark the line

Other answers which gave an accurate outcome were also accepted.

2d.
Centre punch hole position

2ei–ii.

Marks	0	1	2	Average
%	20	42	38	**1.2**

2ei.
The hole will not be drilled through the centre of the screw.

Similar answers were acceptable.

2eii.
Engineers' square

Question 2f.

Marks	0	1	Average
%	38	62	**0.6**

Ring spanner

Section D – VBN 777 Handle engineering materials in a safe and proper manner

Questions 1 and 2

Marks	0	1	2	Average
%	8	29	63	**1.6**

Question 1
Option B

Question 2
Option D

Question 3a–c.

Marks	0	1	2	3	4	5	Average
%	1	3	8	18	30	39	**3.9**

3a.
Any two of (or similar):

- hold the bar angled up at front
- do not bend backwards when lifting

- ensure the pathway is clear.

3b.

- cut hands from sharp edges of the saw cut
- metal may be hot

Similar answers were acceptable.

3c.

A description of any one of:

- proper use of a mechanical lifting device
- using a two-person lift
- individual lift using the correct lifting technique.

Questions 4 and 5

Marks	0	1	2	Average
%	22	45	33	**1.1**

Question 4

To protect the lathe bed from damage

Question 5

Electric motor

Questions 6–8

Marks	0	1	2	3	4	5	6	Average
%	1	3	6	13	27	20	31	**4.5**

Question 6

Any two of (or similar):

- cutting hands on sharp edges
- dropping the sheet metal on themselves
- the lower edge of sheet metal hitting shins
- tripping over when walking.

Question 7

Any two of (or similar):

- test for weight before lifting
- check for sharp edges or similar that could injure you
- make sure the path is clear
- make sure the load is stable.

Question 8

Electric, so no dangerous exhaust fumes are present in the enclosed area of the shipping container

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

Question 1a.

Marks	0	1	Average
%	72	28	**0.3**

Holding work square for drilling, milling or marking out

Similar answers were acceptable.

Question 1b.

Marks	0	1	2	3	4	5	6	Average
%	0	0	3	8	29	37	23	**4.7**

Tool – Scriber
Use – Marking the centre of holes or slots or edge of angle plate

Tool – Dividers
Use – Marking out holes or ends of slots

Tool – Centre punch
Use – Punching centre of holes

Question 1c.

Marks	0	1	Average
%	46	54	**0.6**

10.2 mm

Question 1d.

Marks	0	1	Average
%	76	24	**0.3**

Twist drill

Question 1e.

Marks	0	1	Average
%	32	68	**0.7**

Option A

Question 1f.

Marks	0	1	Average
%	35	65	**0.7**

Regularly back off the drill to break the chip

Question 1g.

Marks	0	1	2	Average
%	31	26	43	**1.1**

- drill sleeve – increasing the taper size of drills and centres, etc.
- drill drift – removing tapers from spindles and sleeves

Question 1h.

Marks	0	1	2	Average
%	71	1	29	**0.6**

490 rpm (approximately)

Common mistakes included students selecting the wrong material and not selecting the ‘drill’ column.

Question 1i–j.

Marks	0	1	2	Average
%	9	34	57	**1.5**

1i.
Option D

1j.

Question 1ki–iii.

Marks	0	1	2	3	Average
%	3	19	40	38	**2.2**

1ki.
A

1kii.
A

1kiii.
C

Question 1li–ii.

Marks	0	1	2	Average
%	9	68	23	**1.2**

1li.
Vernier caliper (vernier was also accepted)

1lii.
79.36 mm

Question 1m.

Marks	0	1	Average
%	28	72	**0.7**

Flat file

Question 2a–b.

Marks	0	1	2	Average
%	25	42	33	**1.1**

2a.
Cuts on the forward stroke

Similar answers that demonstrated understanding were also accepted.

2b.
Answers between 231 mm and 235 mm were accepted.

Question 2ci–ii.

Marks	0	1	2	Average
%	13	31	57	**1.5**

2ci.
The cut is too far away from the vice jaws.

2cii.

- cut will be noisy
- blade could break

Similar answers which demonstrated understanding were also accepted.

Question 2d.

Marks	0	1	Average
%	43	57	**0.6**

Support end with tailstock centre

Question 2e.

Marks	0	1	2	Average
%	36	6	57	**1.2**

$$\text{rpm} = \frac{320 \times 35}{16} = \frac{11200}{16}$$

700 rpm

Question 2f.

Marks	0	1	Average
%	23	77	**0.8**

False

Question 2g–i.

Marks	0	1	2	3	4	5	Average
%	10	12	16	20	20	21	**2.9**

2g.
The tool is above centre height.

2h.
Description of turning the tool to 45° and plunge cutting or using the top slide set at 45°

2i.
Any two of (or similar):

- dirt on the job or micrometer spindle faces
- micrometer is over-tightened
- micrometer not zeroed
- micrometer not held square to the work piece.

Question 2ji–ii

Marks	0	1	2	3	Average
%	20	29	29	22	**1.6**

2ji.
Sketch showing chamfer on the end of the spindle

2jii.
Yes – the side of the die with the 'lead in' or taper should face the work.

Question 2k.

Marks	0	1	Average
%	21	79	**0.8**

D