VCE VET Engineering Studies: Certificate II Engineering Studies Certificate III Engineering Studies

Written examinations

Introduction

The following sample examination is provided to demonstrate the format and types of questions which will be asked in the examinations for this study. The duration of the examinations will be 90 minutes plus 15 minutes reading time.

The examinations are based on the underpinning knowledge and skills specified in the core units of competence from Units 3 and 4 of the 21566VIC Certificate II in Engineering Studies and 21565VIC Certificate III in Engineering Studies.

The elective units of the program will not be examined.

The core units **VBN 771: Apply Electrotechnology Principles in an Engineering Environment** and **VBN 773: Produce Engineering Sketches and Drawings** are common to both Certificate II and Certificate III. Consequently the questions covering these 2 units will be the same on both examination papers.

Certificate II Engineering Studies

Structure and format

All questions will be compulsory. The examination will comprise five sections.

Section A VBN 771: Apply Electrotechnology Principles in an Engineering Environment, will consist of 15 multiple-choice questions worth 1 mark each.

Section B VBN 773: Produce Engineering Sketches and Drawings, will consist of a series of short-answer questions and questions which will require students to sketch components or parts of components. Students will not be required to undertake drawings which will require the use of drawing instruments. This section will be worth approximately 15 marks.

Section C VBN 776: Use Basic Engineering Components to Plan the Manufacture of Engineering Components, will consist of a series of short-answer questions. This section will be worth approximately 15 marks.

Section D VBN 777: Handle Engineering Materials, will consist of a series of short-answer questions. This section will be worth approximately 15 marks.

Section E VBN 778: Produce Basic Engineering Components and products Using Fabrication and Machining, will consist of a series of short-answer questions. This section will be worth approximately 40 marks.

The examination will be worth approximately 100 marks in total. The examination will be in the form of a question and answer book.

Version 2 – August 2006

Certificate III Engineering Studies

Structure and format

All questions will be compulsory. The examination will comprise four sections.

Section A VBN 771: Apply Electrotechnology Principles in an Engineering Environment, will consist of 15 multiple-choice questions worth 1 mark each.

Section B VBN 773: Produce Engineering Sketches and Drawings, will consist of a series of short answer questions and questions which will require students to sketch components or parts of components. Students will not be required to undertake drawings which will require the use of drawing instruments. This section will be worth approximately 15 marks.

Section C VBN 787: Apply Mathematical Principles to Engineering Designs, will consist of a series of mathematical calculations and short answer questions which include calculations. This section will be worth approximately 30 marks.

Section D VBN 788: Design and Prototype Components and/or Small Structures Using Engineering Design Principles, will consist of a series of short-answer questions of increasing complexity based around the design and construction of a component or object. This section will be worth approximately 40 marks.

The examination will be worth approximately 100 marks in total. The examination will be in the form of a question and answer book.

Other relevant references

Teachers should refer to the Examination section of the *VCE* and *VCAL Administrative Handbook 2006*, *VCE VET Engineering Studies Assessment Guide*, the VCE VET Engineering Studies page on the VCAA website and to the *VCAA Bulletin* for further advice during the year.

VICTORIAN CURRICULUM AND ASSESSMENT AUTHORITY

Victorian Certificate of Education 2006

SUPERVISOR TO ATTACH PROCESSING LABEL HERE

STUDENT NUMBER

										Letter
Figures										
Words										

VCE VET ENGINEERING STUDIES CERTIFICATE II

Written examination

Day Date 2006

Reading time: *. ** to *.** ** (15 minutes)**
Writing time: *. ** to *.** ** (1 hour 30 minutes)**

QUESTION AND ANSWER BOOK

Structure of book

Section	*Number of questions*	*Number of questions to be answered*	*Number of marks*
A	15	15	15
B	4	4	15
C	6	6	15
D	8	8	15
E	24	24	40
			Total 100

- Students are permitted to bring into the examination room: pens, pencils, highlighters, erasers, sharpeners and rulers.
- Students are NOT permitted to bring into the examination room: blank sheets of paper and/or white out liquid/tape.
- A scientific calculator is allowed in this examination.

Materials supplied
- Question and answer book of 20 pages.
- Answer sheet for multiple-choice questions.

Instructions
- Write your **student number** in the space provided above on this page.
- Check that your **name** and **student number** as printed on your answer sheet for multiple-choice questions are correct, **and** sign your name in the space provided to verify this.
- All written responses must be in English.

At the end of the examination
- Place the answer sheet for multiple-choice questions inside the front cover of this book.

Students are NOT permitted to bring mobile phones and/or any other unauthorised electronic devices into the examination room.

July 2006

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

Instructions for Section A

Answer **all** questions in pencil on the answer sheet provided for multiple-choice questions.
Choose the response that is **correct** or that **best answer**s the question.
A correct answer scores 1, an incorrect answer scores 0.
Marks will **not** be deducted for incorrect answers.
No marks will be given if more than one answer is completed for any question.

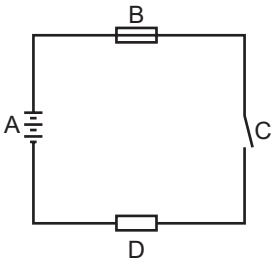
Question 1

_____ is the electrical property of a material describing its ability to oppose an electric current.

A. Resistance
B. Voltage
C. Amperage
D. Wattage

Question 2

Select the letter that indicates a **switch** in the schematic diagram below.



A. A
B. B
C. C
D. D

Question 3

Which symbol represents a **resistor**?

A. 
B. 
C. 
D. 

Question 4

Which one of the following formulas is the correct mathematical representation of Ohm's Law?

A. $I = \frac{V}{R}$
B. $I = V \times R$
C. $R = V \times I$
D. $V = R + I$

Question 5

Which one of the following is the best test instrument to measure electrical pressure in a circuit?

A. ohmmeter
B. ammeter
C. voltmeter
D. wattmeter

Question 6

Current in a conductor is the result of movement of

A. free electrons.
B. protons.
C. negative ions.
D. electron orbits.

Question 7

The unit of electric current is the

A. watt.
B. ampere.
C. volt.
D. ohm.

Question 8

An ohmmeter is set to its 'ohms × 100' range and is indicating 500 on the scale.
The actual resistance is

A. 5 R.
B. 500 R.
C. 50 k Ω.
D. 5 M Ω.

Question 9

If the temperature of a coil of copper wire increases, its resistance

A. increases.
B. decreases.
C. remains unchanged.
D. drops to zero.

Question 10

Power used in an electrical circuit is measured in

A. volts.
B. watts.
C. amperes.
D. ohms.

Question 11

A resistor with colour bands of orange, white, yellow, has a value of

A. 390 Ω.

B. 39 k Ω.

C. 3.9 Ω.

D. 390 k Ω.

Question 12

Two fault conditions that require circuit protection are

A. open circuit and closed circuit.

B. overload and short circuit.

C. overload and open circuit.

D. earth leakage and open circuit.

Question 13

A blown fuse usually indicates

A. a faulty fuse.

B. an open circuit in an appliance.

C. reduced circuit resistance.

D. increased circuit resistance.

Question 14

A circuit breaker can be used to replace

A. a battery.

B. a fuse.

C. a thermocouple.

D. an electromagnet.

Question 15

A battery provides a source of electrical

A. resistance.

B. pressure.

C. displacement.

D. opposition.

END OF SECTION A

SECTION B – VBN 773 Produce engineering sketches and drawings

Instructions for Section B

Answer **all** questions in the spaces provided.

Question 1

Using the following list complete the table below.

hidden outlines
continuous – thick
chain – thin
cutting planes

Line type	Typical applications
	Visible outlines; general details; existing buildings
Continuous – thin	Dimension lines; projection lines; leader lines; hatching; outlines of revolved sections; fold lines; short centre lines
Continuous – thin, ruled with zig-zag	Break lines – other than on an axis
Dashed – thin	
	Centre lines; pitch lines; path lines indicating movement; features in front of cutting plane; developed views; material to be removed
Chain – thin, thick at ends	

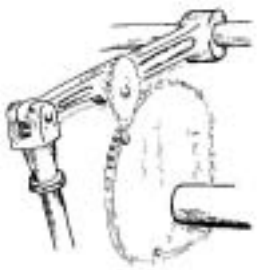
4 marks

Question 2

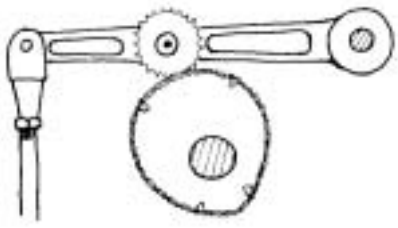
From the following list of drawing types label the sketches below.

paralline orthogonal pictorial schematic

i.



ii.



_____ _____

2 marks

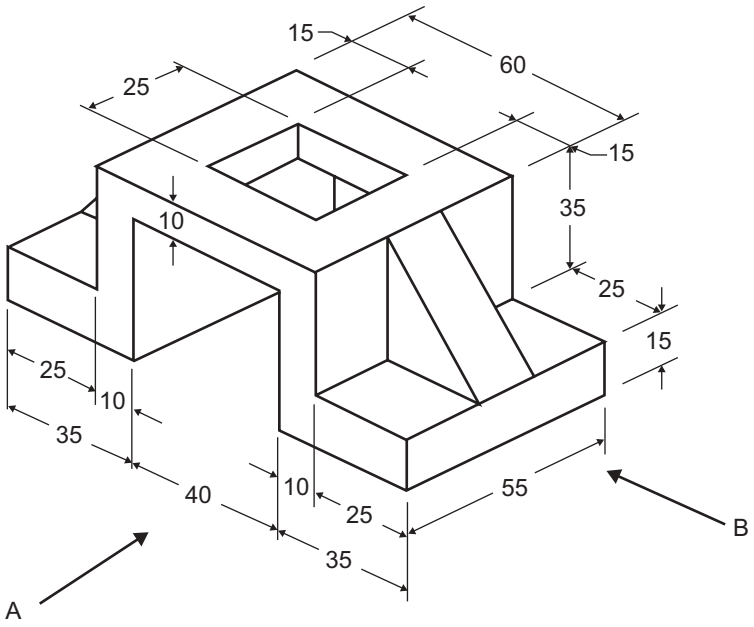
Question 3

Below is an isometric view of an engineering component.

You are required to **sketch two** aligned drawings of the object.

a. Sketch a front view from direction A of the object. Maintain proportion and use the starting corner guides.

b. Sketch a side view from direction B of the object. Maintain proportion and use the starting corner guides.



Front view

Side view

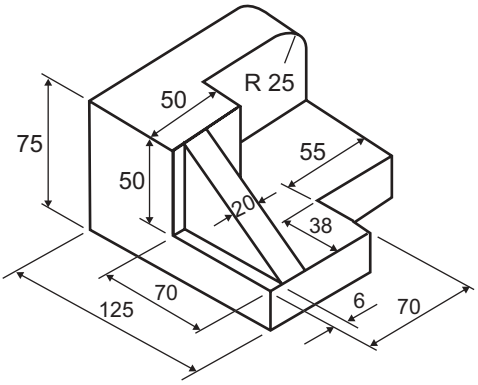
6 marks

Question 4

Below are examples of the different types of engineering drawing. Label each drawing, selecting your answers from the following list.

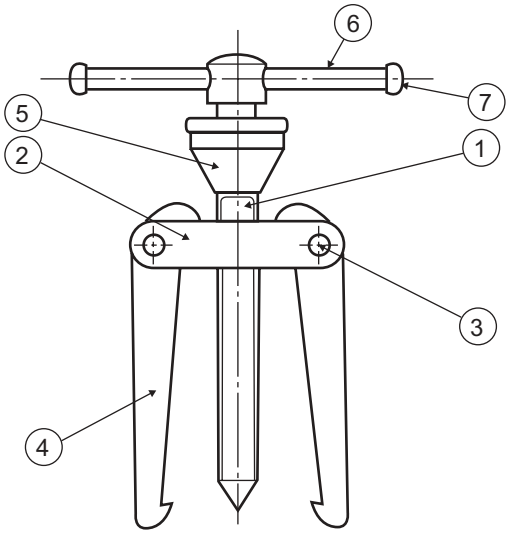
assembly drawing
subassembly drawing
detailed assembly drawing
detailed drawing

i.



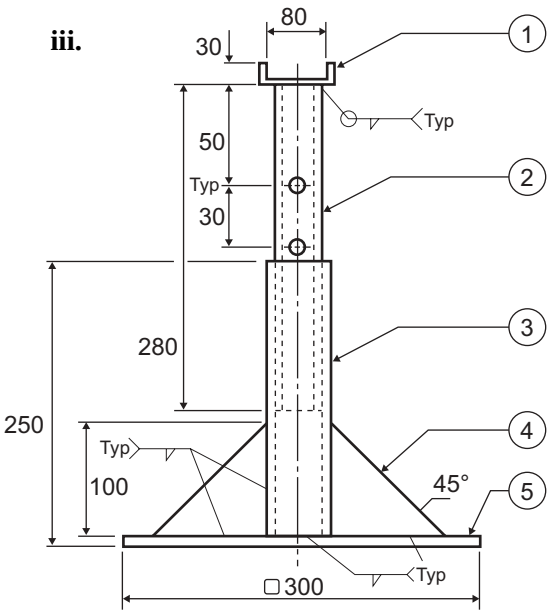
_____

ii.



_____

iii.



_____

3 marks

Total 15 marks

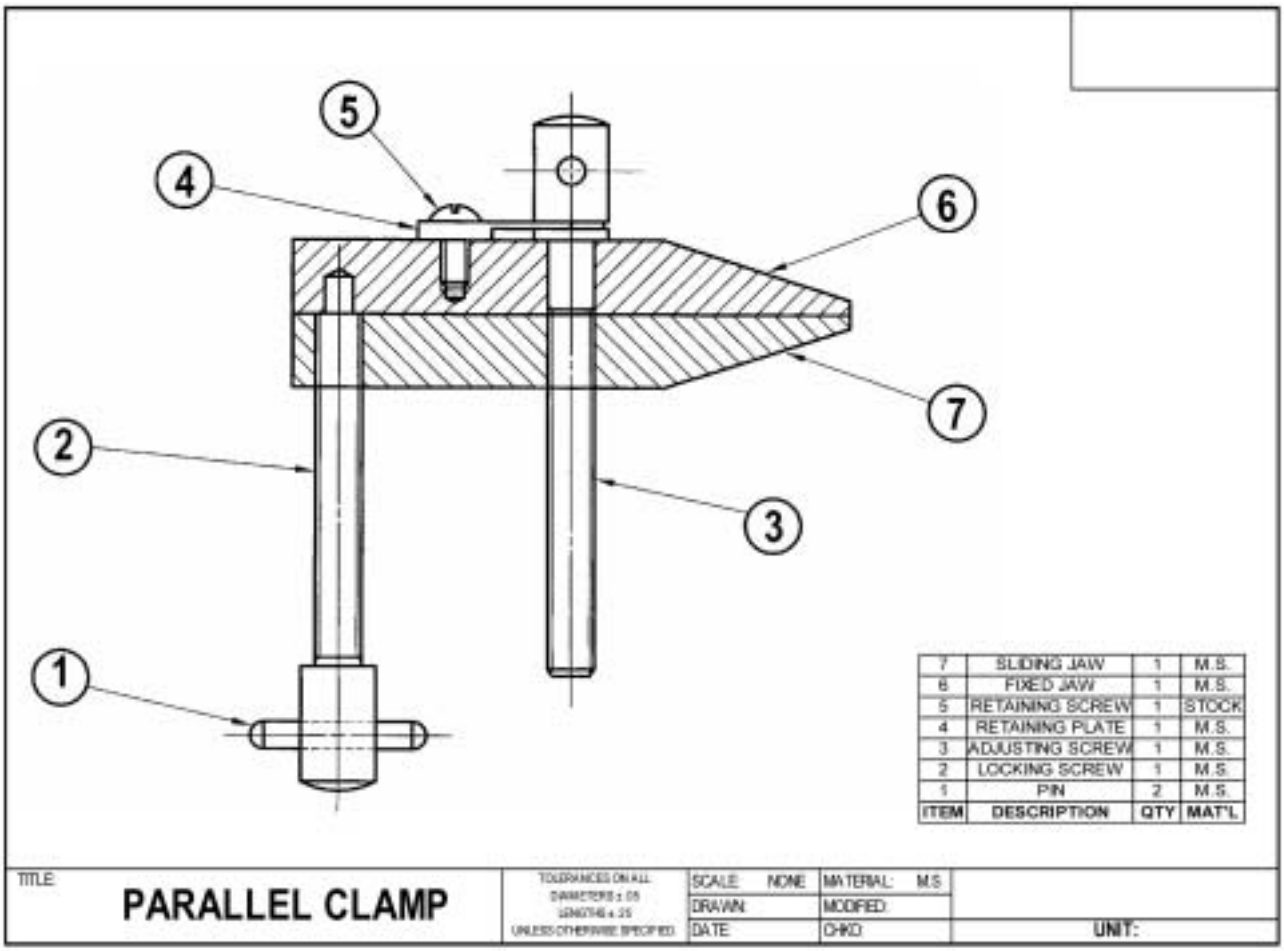
END OF SECTION B
TURN OVER

SECTION C – VBN 776 Using basic engineering principles to plan the fabrication of engineering components

Instructions for Section C

Answer **all** questions in the spaces provided.

The following drawing represents a parallel clamp. This clamp is used in the workshop for a variety of purposes, including clamping and marking out. Your class is about to manufacture a parallel clamp. Different groups will manufacture different components of the clamp and it will be assembled when all the components are completed.



Question 1

Name a suitable material for the manufacture of a fixed jaw.

_____

1 mark

Question 2

From the assembly drawing, identify the item which would be commercially available.

_____

1 mark

Question 3

The tolerance on the diameters for the parallel clamp is +/– .05 mm. What does the term tolerance mean in these specifications?

_____

1 mark

Before you begin manufacturing the different components of the parallel clamp you will need to carefully plan the manufacture. You will need to have a complete list of the operations, types of machine, work holding methods, equipment and types of cutters needed to complete the task. This planning will be done on an operational planning sheet. A copy of an operational planning sheet is shown below.

Question 4

Complete the operational planning sheet for the **sliding jaw – item 7** component of the parallel clamp. All of the operation descriptions are listed. You will need to complete the other columns.

OPERATIONAL PLANNING SHEET

Part Name: Sliding Jaw – item 7

Op. No.	Operation description	Type of machine	Work holding method	Equipment	Type of cutter
1	Check size	NA*	Hand	Steel rule	NA*
2	Clean and debur	NA*			NA*
3	Mark out	NA*		i. ii. iii.	NA*
4	Drill and tap				
5	Mill the taper (angle)				
6	File ends square	NA*			NA*
7	Finish	NA*	Hand or Vice	i. File, ii. Emery cloth	NA*

* NA = Not applicable

4 marks

Question 5

Complete the operational planning sheet for the **locking screw – item 2** component of the parallel clamp. All of the operation descriptions are listed. You will need to complete the other columns.

Part Name: Locking screw – item 2

Op. No.	Operation description	Type of machine	Work holding method	Equipment	Type of cutter
1	Check size	NA*	Hand	Steel rule	NA*
2	Clean and debur	NA*	Vice	File	NA*
3	Face and centre drill				
4	Turn outside diameters of the screw				
5	Produce screw thread				
6	Turn and champer location screw outside diameter				NA*
7	Mark out hole	NA*			NA*
8	Drill hole				
9	Finish/Debur	NA*	NA*	Emery cloth File	NA*

* NA = Not applicable

6 marks

Question 6

Excessive noise is one environmental problem in the workplace.

Name **two** considerations that need to be identified before starting the manufacturing operations.

i. _____

ii. _____

2 marks

Total 15 marks

END OF SECTION C

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

Instructions for Section D

Answer **all** questions in the spaces provided.

Question 1

Back injury is one of the most common health and safety issues in the workplace. What are the **three most important strategies** used to ensure a load is lifted correctly?

i. _____

ii. _____

iii. _____

3 marks

Question 2

Describe how you would organise a team lift.

_____

_____

_____

_____

_____

2 marks

Question 3

Name a mechanical device for moving an oxygen cylinder from the workshop.

_____

1 mark

A MSDS is often required in the workforce.

Question 4

a. What do the initials MSDS stand for?

_____

_____

b. Why would you need to refer to a MSDS?

_____

_____

1 + 1 = 2 marks

Question 5

How would you measure noise in the workplace?

_____

_____

_____

1 mark

Test lifts are important in the workplace.

Question 6

a. Why is it important to have a test lift?

_____

_____

b. How would you size up a load to be lifted?

_____

_____

1 + 1 = 2 marks

Question 7

Give **two** examples of dangerous materials.

i. _____

ii. _____

2 marks

Question 8

Name **two** mechanical aids to assist in the movement of heavy materials.

i. _____

ii. _____

2 marks

Total 15 marks

END OF SECTION D

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

Instructions for Section E

Answer **all** questions in the spaces provided.

Question 1

You are just starting in a new workplace. Name **three** items you must bring with you to ensure that minimum safety requirements are met?

_____

_____

_____

1 mark

Question 2

Safety precautions in the workshop are essential. Give **one** reason why they are important.

_____

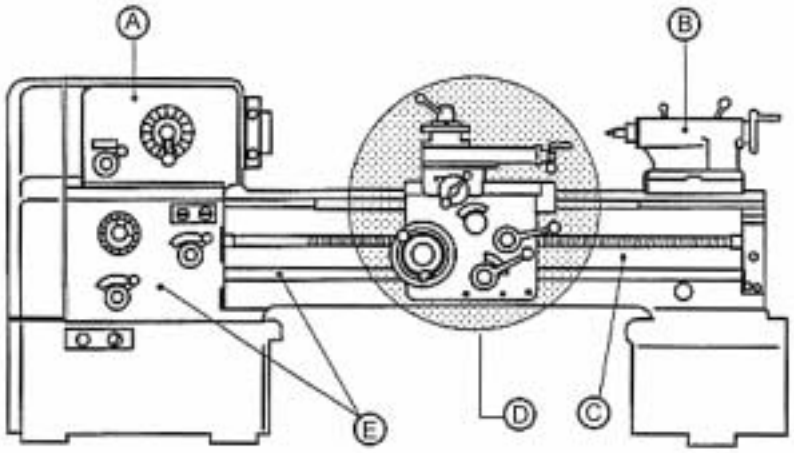
_____

_____

_____

1 mark

Question 3



Name the parts of the lathe identified by the letters A–E.

A _____

B _____

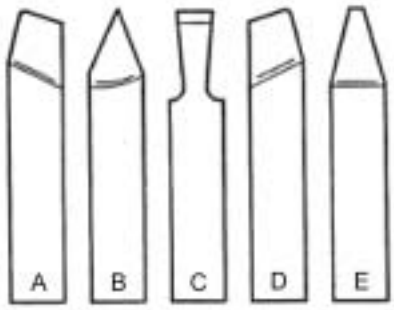
C _____

D _____

E _____

5 marks

Question 4



lathe tools

a. What is the name of the lathe tool marked B?

_____

b. What is this lathe tool B used for?

_____

1 + 1 = 2 marks

Question 5

What is the name of the part of the lathe that is used to turn a taper on a workpiece?

1 mark

Question 6

Why would you use a four jaw chuck to hold a black mild steel shaft Ø 50?

1 mark

Question 7

What is the purpose of the following equipment?

i. parallel strips

ii. odd leg (Jenny) calipers

iii. prick punch

3 marks

Question 8

A cutting tool is marked HSS. What do these letters stand for?

1 mark

Question 9

What is the full name of the drill shown?

_____

1 mark

Question 10

Name **two** types of cut off machines.

i. _____

ii. _____

2 marks

Question 11

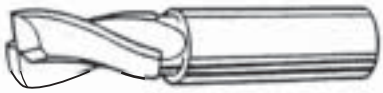
A horizontal mill is one type of milling machine. Name **one** other.

_____

1 mark

Question 12

Name the following types of milling cutters.

i.  _____

ii.  _____

2 marks

Question 13

Name **one** type of wheel dresser.

_____

1 mark

Question 14

Using a machine vice is one method of holding work on a milling machine.
What is another method?

_____

1 mark

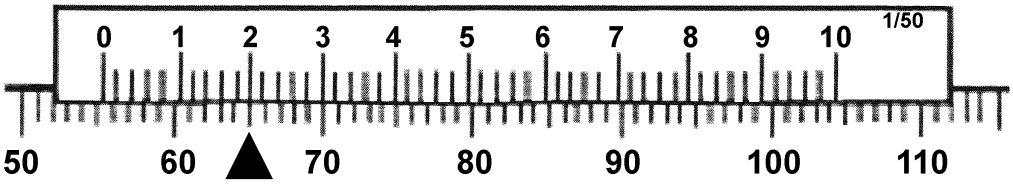
Question 15

Why is wheel dressing necessary on grinding wheels?

1 mark

Question 16

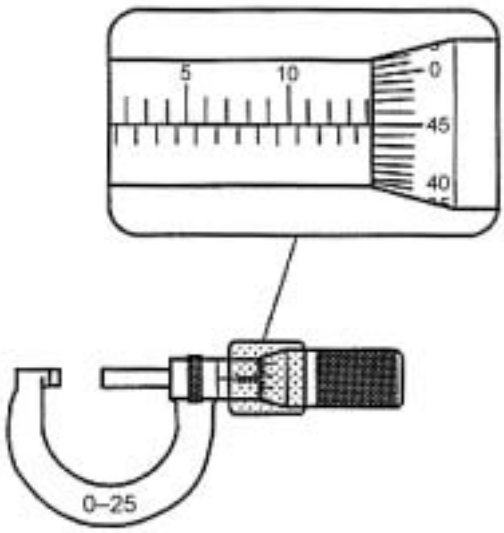
What is the reading of the vernier caliper scale shown?



2 marks

Question 17

What is the reading on the micrometer shown?



2 marks

Question 18

Listed below are four commonly used joining methods. For each method give an example of what you would use it for.

i. blind rivet

Used for _____

ii. self-tapping screw

Used for _____

iii. soldering

Used for _____

iv. hexagon bolt

Used for _____

4 marks

Question 19

What is a datum point?

_____

_____

_____

1 mark

Question 20

Calculate the rpm for a diameter 10 drill if the recommended cutting speed is 40 m/min. ($\text{rpm} = \frac{300\ v}{d}$) where v = cutting speed.

1 mark

Question 21

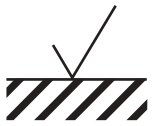
You are using a cemented carbide cutting tool. Use the nomogram on page 20 to calculate the approximate rpm to finish turn 25 diameter mild steel.

_____

1 mark

Question 22

The following symbol indicates a type of surface finish.



Name the finish.

_____

1 mark

Swarf is a danger in the workplace.

Question 23

a. Why is swarf dangerous?

_____

b. Describe a safe method of swarf removal.

_____

1 + 1 = 2 marks

Question 24

Name one ferrous and one non-ferrous metal.

ferrous metal _____

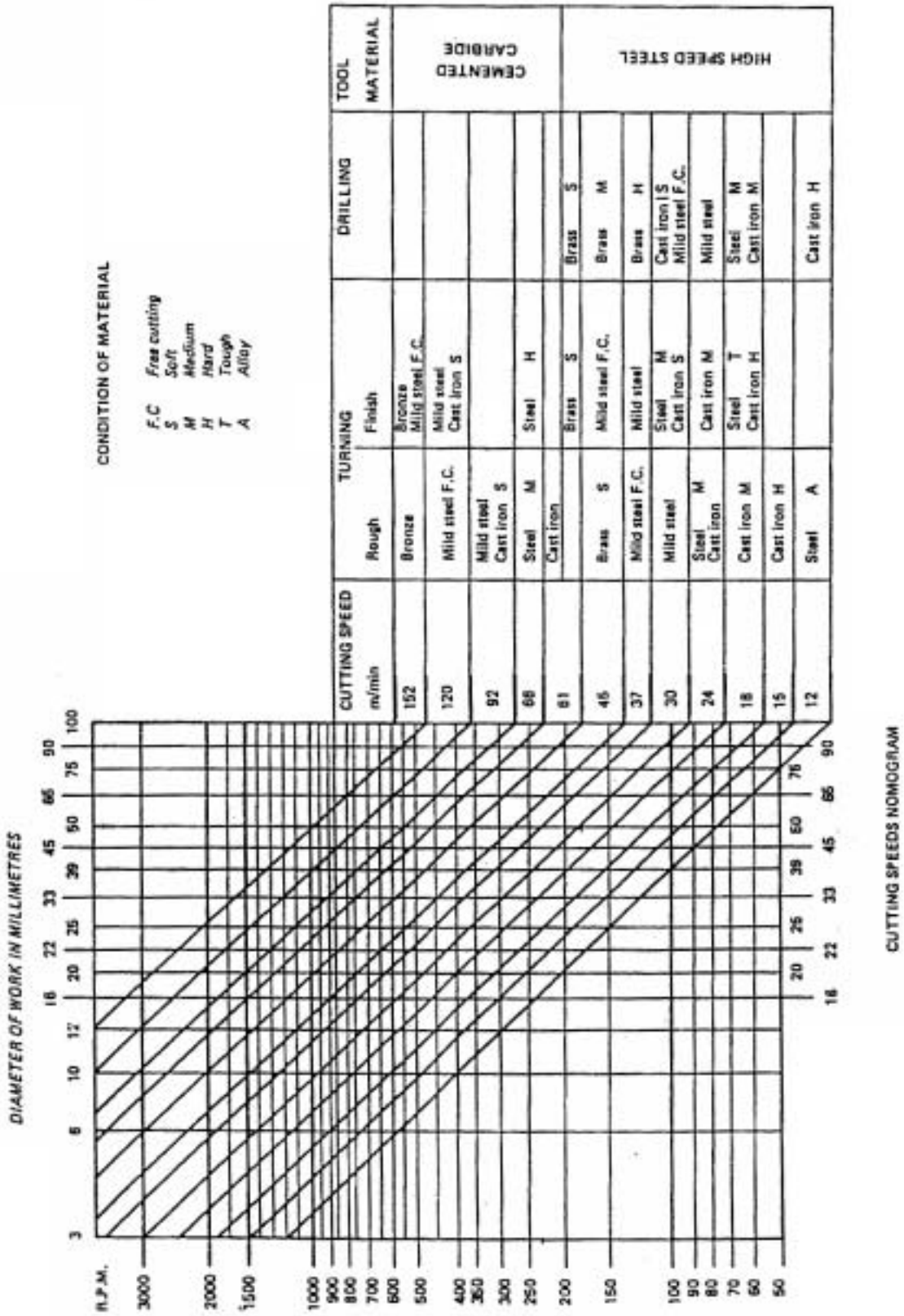
non-ferrous metal _____

2 marks

Total 40 marks

END OF SECTION E
TURN OVER

Cutting speeds nomogram



END OF QUESTION AND ANSWER BOOK

VICTORIAN CURRICULUM AND ASSESSMENT AUTHORITY

Victorian Certificate of Education 2006

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STUDENT NUMBER

										Letter
Figures										
Words										

VCE VET ENGINEERING STUDIES CERTIFICATE III

Written examination

Day Date 2006

Reading time: *. ** to *.** ** (15 minutes)**
Writing time: *. ** to *.** ** (1 hour 30 minutes)**

QUESTION AND ANSWER BOOK

Structure of book

Section	*Number of questions*	*Number of questions to be answered*	*Number of marks*
A	15	15	15
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- Students are permitted to bring into the examination room: pens, pencils, highlighters, erasers, sharpeners and rulers.
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- A scientific calculator is allowed in this examination.

Materials supplied
- Question and answer book of 19 pages with a formula sheet on page 19.
- Answer sheet for multiple-choice questions.

Instructions
- Write your **student number** in the space provided above on this page.
- Check that your **name** and **student number** as printed on your answer sheet for multiple-choice questions are correct, **and** sign your name in the space provided to verify this.
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At the end of the examination
- Place the answer sheet for multiple-choice questions inside the front cover of this book.

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Version 2 – August 2006

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

Instructions for Section A

Answer **all** questions in pencil on the answer sheet provided for multiple-choice questions.
Choose the response that is **correct** or that **best answer**s the question.
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Question 1

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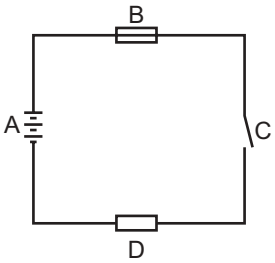

A. A
B. B
C. C
D. D

Question 3

Which symbol represents a **resistor**?

A. 
B. 
C. 
D. 

Question 4

Which one of the following formulas is the correct mathematical representation of Ohm's Law?

A. $I = \frac{V}{R}$
B. $I = V \times R$
C. $R = V \times I$
D. $V = R + I$

Question 5

Which one of the following is the best test instrument to measure electrical pressure in a circuit?

A. ohmmeter
B. ammeter
C. voltmeter
D. wattmeter

Question 6

Current in a conductor is the result of movement of

A. free electrons.
B. protons.
C. negative ions.
D. electron orbits.

Question 7

The unit of electric current is the

A. watt.
B. ampere.
C. volt.
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An ohmmeter is set to its 'ohms × 100' range and is indicating 500 on the scale.
The actual resistance is

A. 5 R.
B. 500 R.
C. 50 k Ω.
D. 5 M Ω.

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If the temperature of a coil of copper wire increases, its resistance

A. increases.
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C. amperes.
D. ohms.

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B. 39 k Ω.

C. 3.9 Ω.

D. 390 k Ω.

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Two fault conditions that require circuit protection are

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B. overload and short circuit.

C. overload and open circuit.

D. earth leakage and open circuit.

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A blown fuse usually indicates

A. a faulty fuse.

B. an open circuit in an appliance.

C. reduced circuit resistance.

D. increased circuit resistance.

Question 14

A circuit breaker can be used to replace a/n

A. battery.

B. fuse.

C. thermocouple.

D. electromagnet.

Question 15

A battery provides a source of electrical

A. resistance.

B. pressure.

C. displacement.

D. opposition.

END OF SECTION A

SECTION B – VBN 773 Produce engineering sketches and drawings

Instructions for Section B

Answer **all** questions in the spaces provided.

Question 1

Using the following list complete the table below.

hidden outlines
continuous – thick
chain – thin
cutting planes

Line type	Typical applications
	Visible outlines; general details; existing buildings
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Continuous – thin, ruled with zig-zag	Break lines – other than on an axis
Dashed – thin	
	Centre lines; pitch lines; path lines indicating movement; features in front of cutting plane; developed views; material to be removed
Chain – thin, thick at ends	

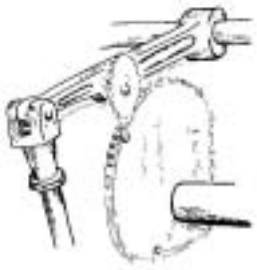
4 marks

Question 2

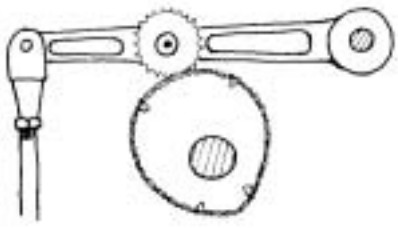
From the following list of drawing types label the sketches below.

paralline orthogonal pictorial schematic

i.



ii.



_____ _____

2 marks

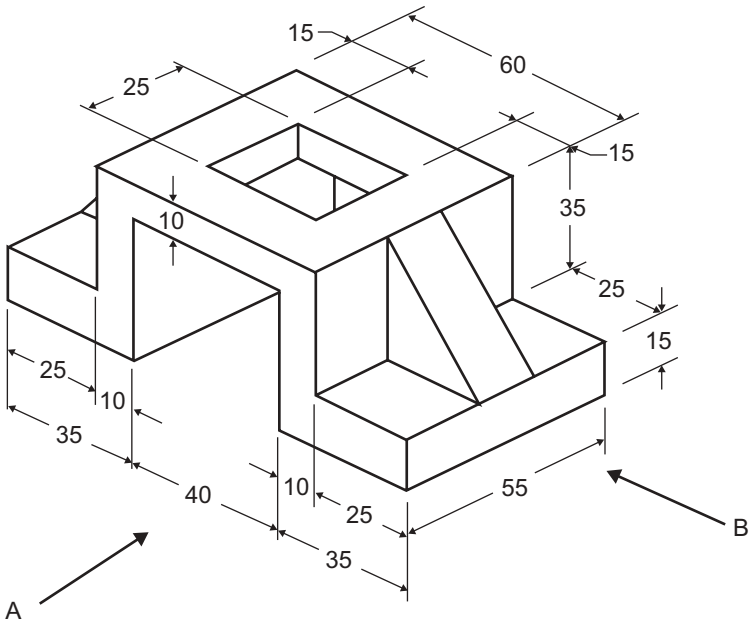
Question 3

Below is an isometric view of an engineering component.

You are required to **sketch two** aligned drawings of the object.

a. Sketch a front view from direction A of the object. Maintain proportion and use the starting corner guides.

b. Sketch a side view from direction B of the object. Maintain proportion and use the starting corner guides.



Front view

Side view

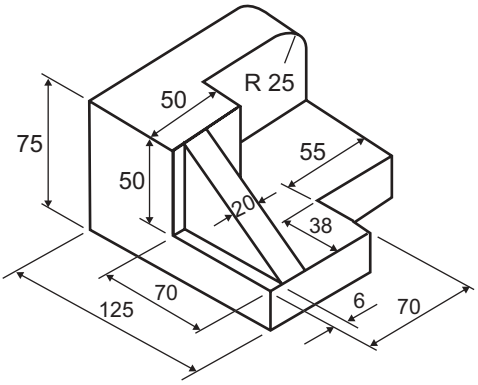
6 marks

Question 4

Below are examples of the different types of engineering drawing. Label each drawing, selecting your answers from the following list.

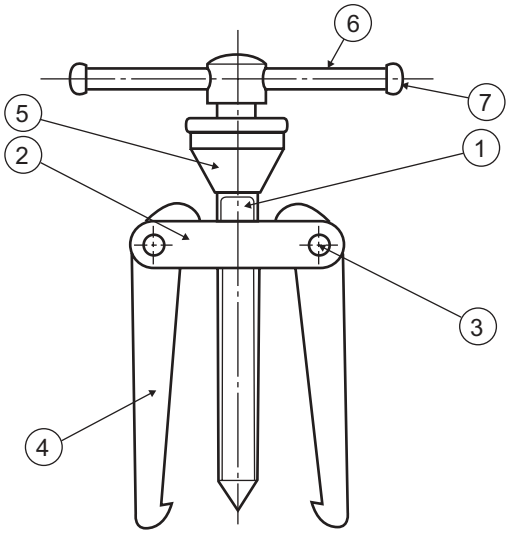
assembly drawing
subassembly drawing
detailed assembly drawing
detailed drawing

i.



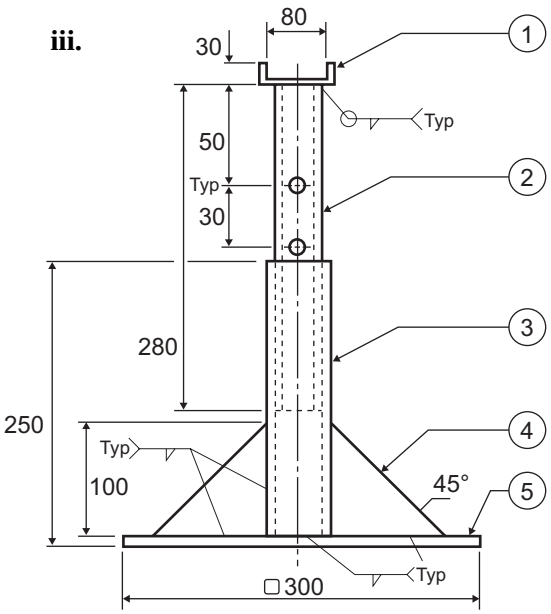
_____

ii.



_____

iii.



_____

3 marks

Total 15 marks

END OF SECTION B
TURN OVER

SECTION C – VBN787 Apply mathematical principles to engineering designs

Instructions for Section C

Answer **all** questions in the spaces provided. Where a question is worth more than one mark you **must** show your working. A formula sheet is provided on page 19. You may use a scientific calculator.

Question 1

a. Find the square root of 25 _____

b. Find the cube root of 81 _____

1 + 1 = 2 marks

Question 2

Convert the following from imperial to metric. You may use your scientific calculator to do this.

a. 1.061" _____

b. 3.62 lbs _____

c. 10 square feet _____

d. 10 cubic feet _____

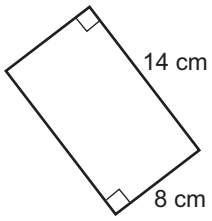
e. 80°F _____

1 + 1 + 1 + 1 + 1 = 5 marks

Question 3

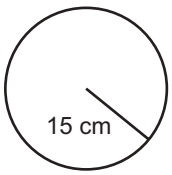
Find the area of the following shapes.

a.



_____

b.



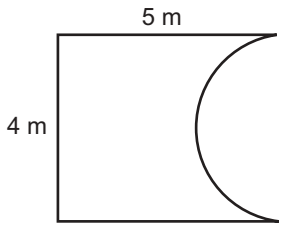
_____

1 + 1 = 2 marks

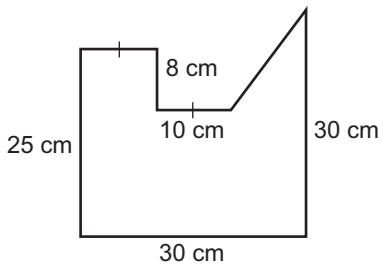
Question 4

The diagrams below show **two** different shapes. Calculate the area of each of the shapes.

a.



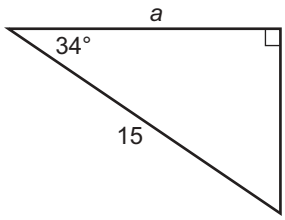
b.



2 + 2 = 4 marks

Question 5

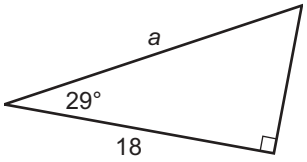
Find the value of the pronumeral, *a*, in this diagram.



2 marks

Question 6

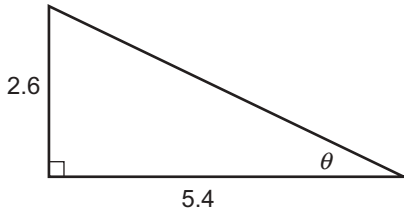
Find the value of the pronumeral, a, in this diagram.



2 marks

Question 7

Find the size of the angle, θ, in this triangle.



1 mark

Question 8

Use your calculator to find the values of the following (rounded off to four decimal places).

a. sin 45° _____

b. cos 70° _____

1 + 1 = 2 marks

Question 9

Convert the following degrees to radians.

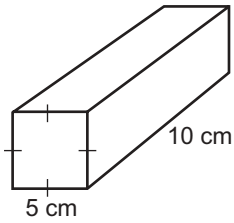
20° _____

1 mark

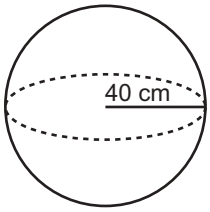
Question 10

Find the volume of these solids to the nearest whole number.

a.



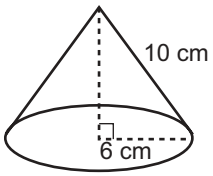
b.



1 + 1 = 2 marks

Question 11

We are given the slant height and radius of the following cone.



What is the curved surface area of the cone?

1 mark

Question 12

Factorise the following using the common factor method.

$$3h^2y + 12h\,^2y^2$$

1 mark

Question 13

Consider the equation: $y = 4x - 17$.

What kind of relationship exists between y and x?

(Note: you do not have to solve this equation.)

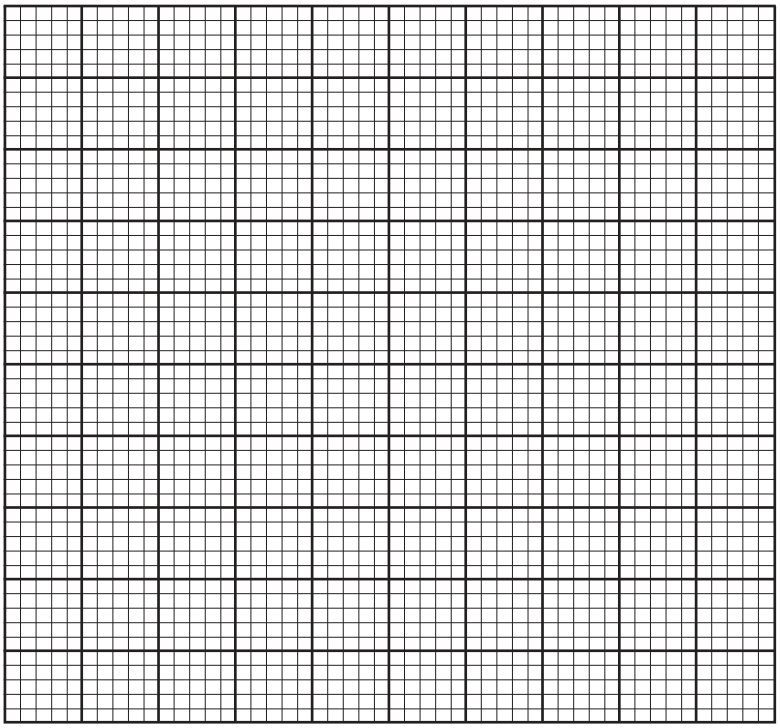
1 mark

Question 14

a. On the table below complete values for the rule $y = x + 4$

x	–3	–2	–1	0	1	2	3
y							

b. You now need to plot the points shown in the table.
Use the graph paper to draw a set of axes. Join the points with a straight line.



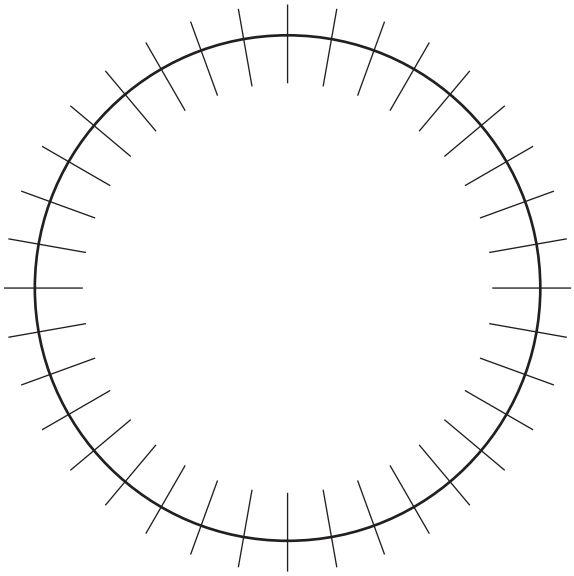
1 + 1 = 2 marks

Question 15

A local engineering workshop produces a number of different items per day. The items and the quantity of each item produced is shown below.

- crank shafts – 220 items
- crank pins – 188 items
- bearing housings – 177 items
- bearing bases – 125 items

Sketch a pie chart using the circle below to diagrammatically represent this production.



2 marks

END OF SECTION C

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

Instructions for Section D

Answer **all** questions in the spaces provided.

Total 30 marksYou have been requested to design a screw operated vice suitable for holding standard-shaped materials such as steel and aluminium. The vice must be able to be used on a table such as a pedestal drill stand. The vice will have a maximum opening capacity of 25 mm.

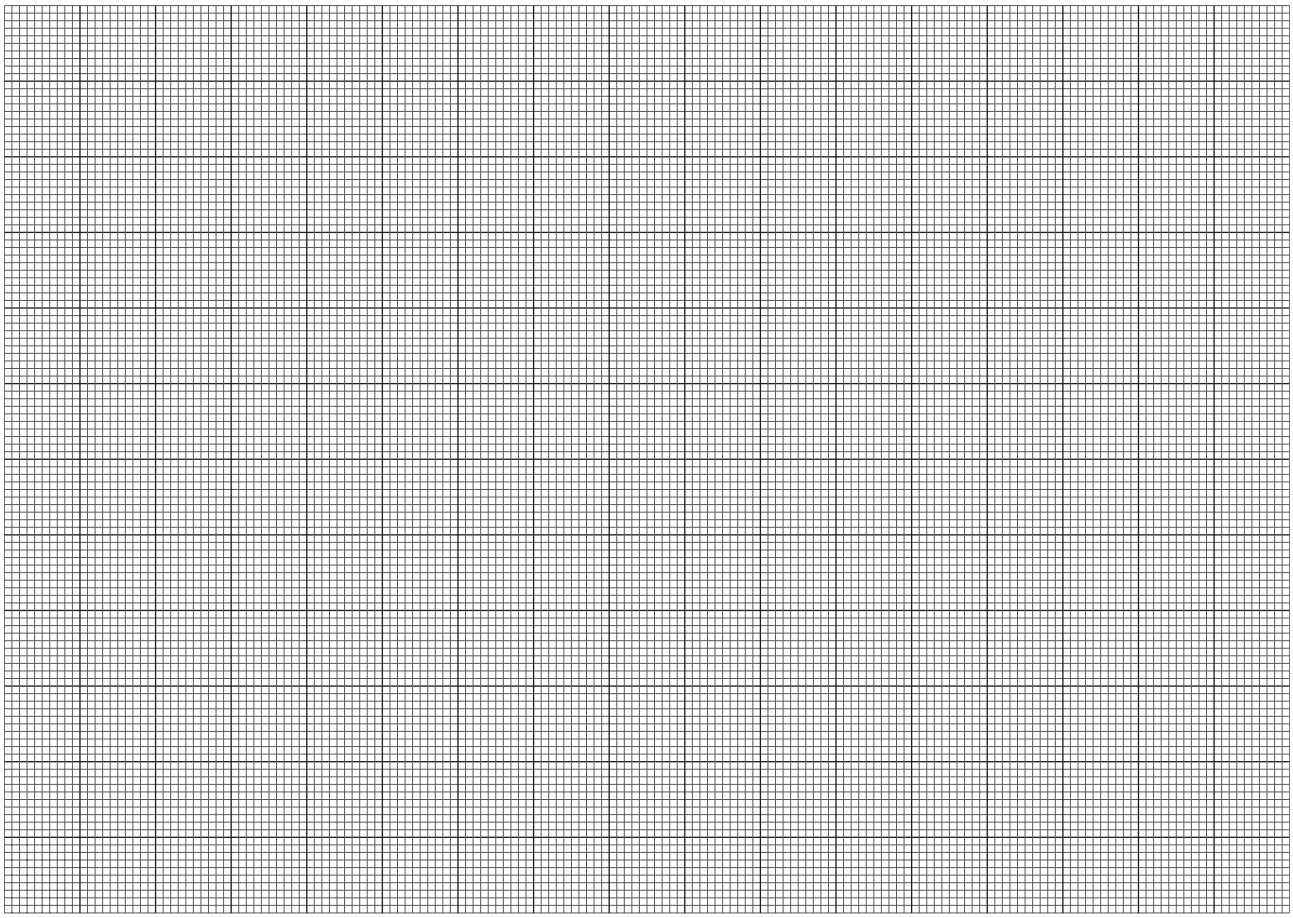
You have access to the following materials.

- a full range of bar stock
- round bright and black mild steel 6 mm to 25 mm diameter
- square bright and black mild steel 6 mm to 25 mm
- 6 and 25 mm thick flat plate available in widths of 50 mm and 100 mm

Question 1

Sketch a 2D assembly design that would be suitable using the available steel. You may use standard items such as screws, nuts and bolts as required. Include overall dimensions. Identify and label two components of your design. One component must use round material and the other must be of another shape.

Sketch of vice



sketch – 5 marks
dimensions – 5 marks

Total 10 marks

Question 2

You will now need to draw **two** separate ideas for handles to tighten the locking screw and jaw.

Handle A **Handle B**

3 + 3 = 6 marks

You are now required to set up the design for model or prototype production. To do this you will need to complete the following cutting sheet. The cutting sheet shows the most suitable material for each part, and the length and shape of each part.

Question 3

- List **two** parts from your sketch that you labelled in **Question 1**.
- Name the shape of steel that you will use for each part.
- Nominate the size and length of each piece of steel you have named.
  (Do not include any commercial items that you intend to use.)

Part name	**Shape of steel**	**Size**	**Length**
Part 1			
Part 2			

2 marks

The next step is to plan the manufacture of the components of the vice. The planning of components should be planned on an operational planning sheet. On the operational planning sheet you need to list a description of each aspect of the operation, the type of machine you will use, the work holding method, the equipment you will use and the type of cutters.

Question 4

Describe how you would manufacture **two** components you have identified and labelled in **Question 1**. Name the components you wish to plan and then complete the operational planning sheets below.

Component 1 – Name of item (round shape material) _____

Op. No.	Operation description	Type of machine	Work holding method	Equipment	Type of cutter
1					
2					
3					
4					

Component 2 – Name of item (other material) _____

Op. No.	Operation description	Type of machine	Work holding method	Equipment	Type of cutter
1					
2					
3					
4					

4 + 4 = 8 marks

During the manufacturing process you will need to use a number of different operating procedures. Each of these operating procedures will require you to take safety precautions before you start and as you are working.

Question 5

Name **three** different operating procedures and give **two** safety precautions for each procedure. You may use each safety precaution only once.

Procedure 1 _____

Safety precaution 1 _____

Safety precaution 2 _____

Procedure 2 _____

Safety precaution 1 _____

Safety precaution 2 _____

Procedure 3 _____

Safety precaution 1 _____

Safety precaution 2 _____

6 marks

Hand tools, power tools, welding or machining equipment all need to be checked before they are used. This ensures good practice that will help maintain equipment.

Question 6

For each of the types of equipment named below, name **two** things that must be checked before commencing work.

Lathe

Check 1 _____

Check 2 _____

Welding equipment

Check 1 _____

Check 2 _____

4 marks

The vice is now almost completed.

In your design for the vice which you sketched, you were required to also draw two separate ideas for handles to tighten the locking screw and jaw.

Question 7

Which of the handles will you use in your vice? Give **two** reasons for your choice.

Handle design A or B _____

Reason 1

_____

_____

Reason 2

_____

_____

2 marks

Your vice now needs to be finished.

Question 8

a. What type of finish will you use on your vice?

_____

b. Give one reason for your choice.

_____

_____

1 + 1 = 2 marks

Total 40 marks

END OF SECTION D

Formula sheet

Area of a circle	πr^2
Area of a triangle	$\frac{1}{2} \times \text{base} \times \text{height}$
Volume of a sphere	$1.333\ \pi r^3$
Area of the curved surface of a cone	πrl

END OF QUESTION AND ANSWER BOOK