



Leaving Certificate Applied, 2016

Vocational Specialism

Graphics and Construction Studies

(240 marks)

Tuesday, 14 June, Morning, 9:30 - 11:00

General Directions

- Write your examination number here:
- There are two sections in this paper.



Section 1 - Answer **both** questions. (105 marks)

- Q1** - Short answer questions
- Q2** - Graphic Communication

Section 2 - Five questions - answer **any 3**. (135 marks)

- Q1** - Construction
- Q2** - Building Services
- Q3** - Woodcraft
- Q4** - Design and Manufacture of Educational Toys
- Q5** - Computer Aided Design

For the Superintendent Only

Centre Stamp

- Write your answers in the spaces provided and include sketches as appropriate.

1.	Total of end of page totals	
2.	Aggregate total of all disallowed question(s)	
3.	Total mark awarded (1 minus 2)	
4.	Bonus mark for answering through Irish (if applicable)	
5.	Total mark awarded if Irish Bonus (3+4)	

Note: The mark in row 3 (or row 5 if an Irish bonus is awarded) must equal the mark in the **Grand Total** box on the script.

Section	Question	Marks	
1	(Both)	1	
		2	
2	(Any Three)	1	
		2	
		3	
		4	
		5	
Total			
Irish Bonus			
Grand Total			

Section 1

COMPULSORY

QUESTION 1

(60 Marks)

1. Answer ANY TWELVE of the following FIFTEEN short questions.

(a) Name the machine shown.

Name: _____

List **TWO** specific safety precautions to be observed when this machine is in use.

1. _____

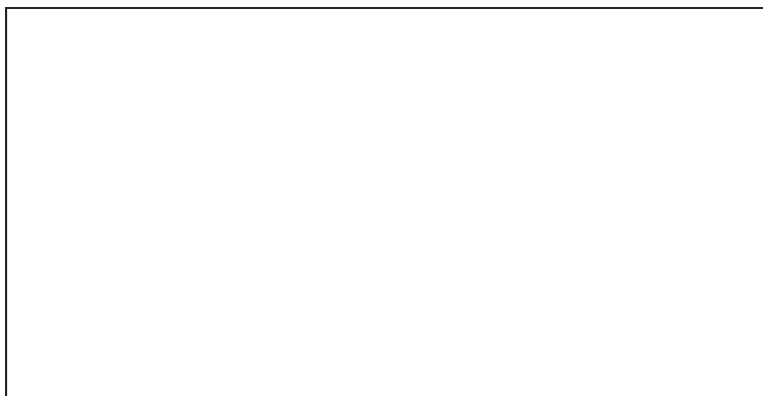
2. _____



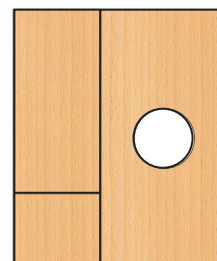
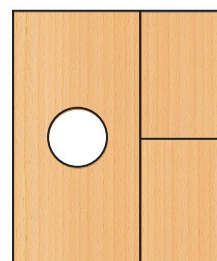
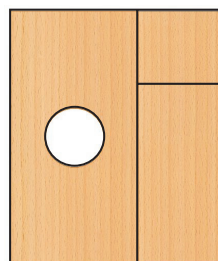
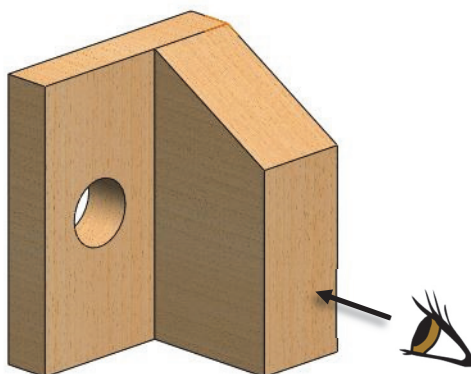
(b) Name the woodworking item shown.

Name: _____

In the space provided below make a freehand sketch of this item.



(c) Indicate, using a tick (✓), which of the three drawings below is the correct elevation of the object on the left, when viewed in the direction of the arrow.



(d) The job of renovating a wooden floor involves sanding and applying **TWO** coats of varnish.

A sander costs €5.50 per hour to hire.

A tin of varnish costs €15 and will give one coat to 12m² of floor.

Calculate the total cost if you need to hire the sander for 5 hours and if the floor area is 48m².



Sander Hire: € _____

No. of Tins: _____
Varnish Cost: € _____

Total Cost: € _____

(e) Give **TWO** reasons why trenches are excavated on building sites.

Reason 1: _____

Reason 2: _____

Outline **ONE** safety precaution to be taken to reduce the risk of an accident occurring while a person is working in a trench.

Precaution: _____



(f) Sketch a suitable joint for joining the parts of the spice rack circled in the diagram.



Blank area for sketching a joint.



(g) Mortar is used when building walls as shown.

List the materials typically used to make mortar.

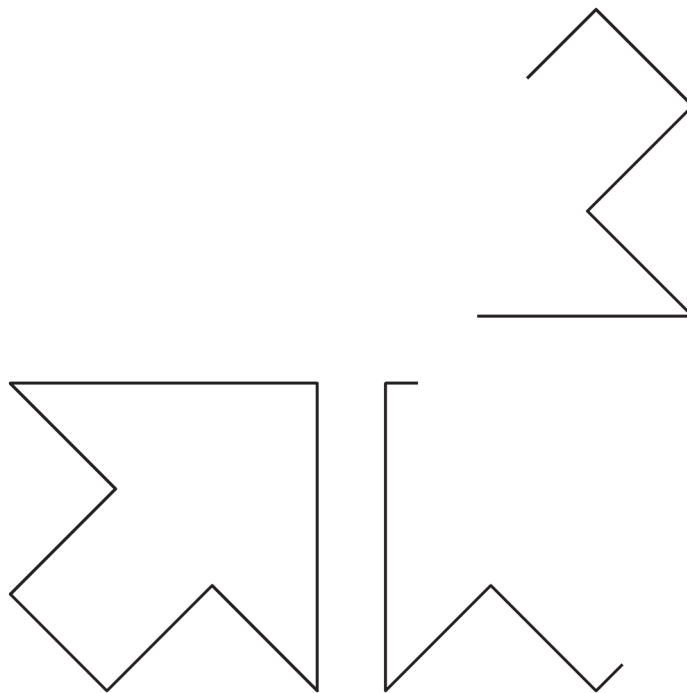
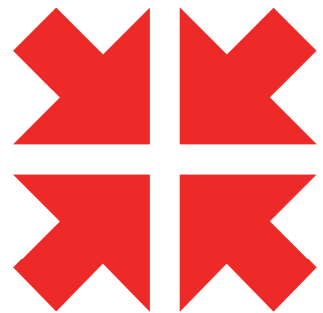
Materials: _____



(h) The logo on the right is based on symmetrical shapes.

Complete the drawing of the logo below.

Use colour **or** shading to enhance your drawing.



(i) Explain what is meant by the term '*Solar Gain*' and discuss its importance in relation to building design.

Explanation: _____

Importance: _____



(j) Name the building component shown and state its function.

Name: _____

Function: _____



(k) The diagram shows a screw being driven into wood.
Indicate, using a tick (✓), the main force acting on the screw.

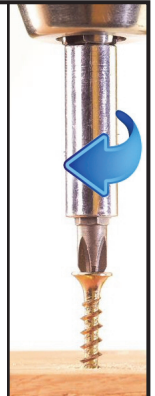
Tension



Torsion

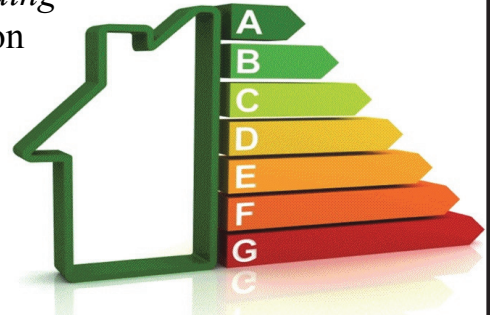


Compression



(l) All houses being sold in Ireland must have a *Building Energy Rating* (BER) certificate. What information does a BER provide for a house buyer?

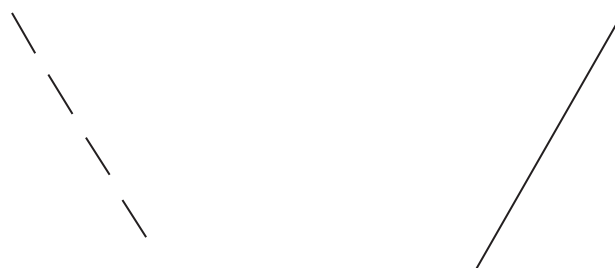
Information: _____



(m) The image on the right shows a company logo.
The logo is based on a hexagon.
Complete the drawing
of the logo below.
Apply appropriate
colour **or** shading.



**BLACK &
DECKER**



(n) The tap shown continues to drip after it has been turned off.

Suggest a reason for this.



List **TWO** consequences of not fixing this drip.

1. _____

2. _____

(o) The image shows a plank of wood which is being cut to make a hurley.

What wood is a hurley usually made from?

Wood: _____

Give **TWO** reasons why this wood is suitable for making hurleys.

Reason 1: _____

Reason 2: _____



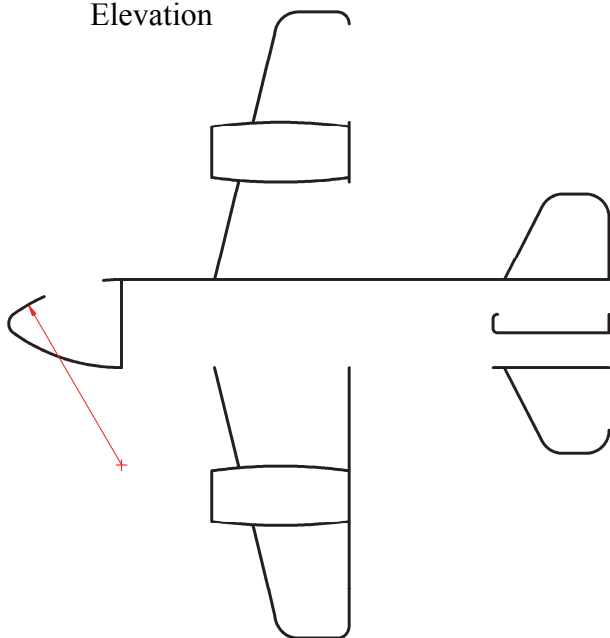
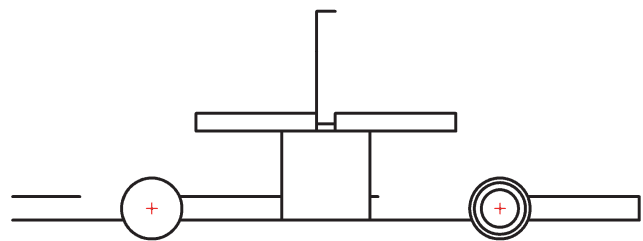
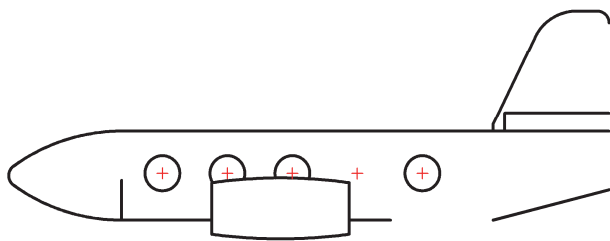
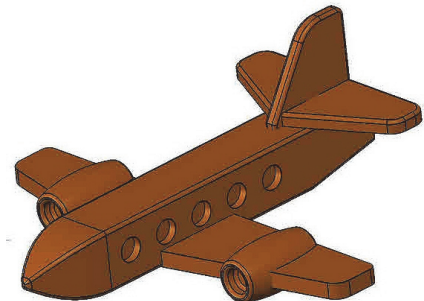
2. Graphic Communication

(a) The graphic on the right shows a pictorial view of a model wooden aeroplane.

(1) Complete the Elevation, Plan and End View of the aeroplane on the drawing below.

(Hidden detail is not necessary.)

(2) Apply appropriate colour or shading to the **completed views**.



Plan

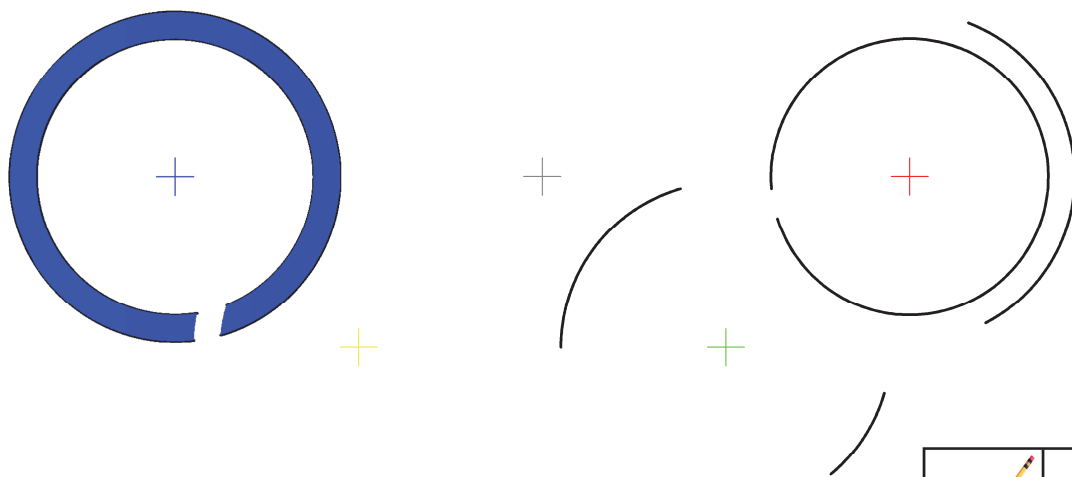


(b) The image on the right shows the logo for the 2016 Olympic Games in Rio, which consists of a specially designed graphic with the traditional five interlocking rings beneath.

(1) Use a compass to complete the drawing of the five interlocking rings below.

(*Note: Pay particular attention to the overlapping of the rings.*)

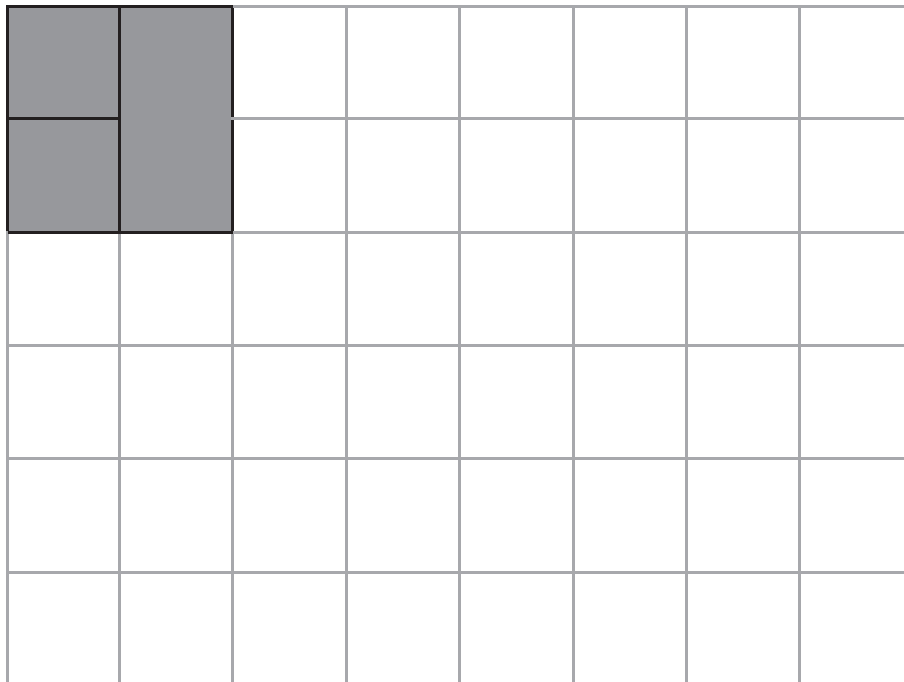
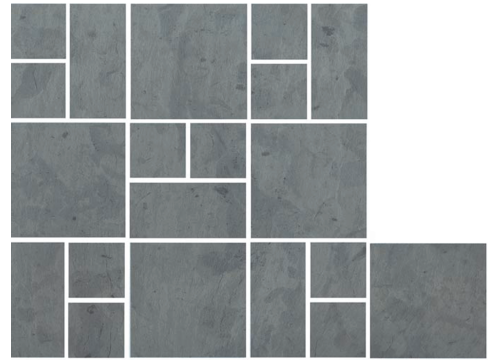
(2) Complete the full logo by using *neat freehand sketching*. Apply appropriate colour to the logo.



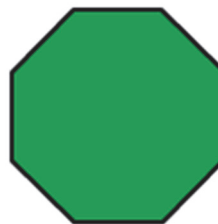
(c) (1) The floor tiles on the right are arranged in a pattern as shown.

On the grid below, draw the tiles in the given pattern. Apply appropriate colour or shading.

(Three tiles have already been done for you.)



(2) Name the **FIVE** polygons shown.



1. _____

2. _____



3. _____

4. _____

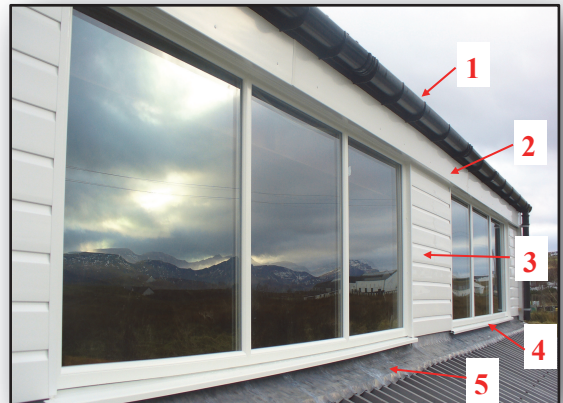
5. _____

Answer ANY THREE questions from this section.

1. Construction

(a) (1) Name the **FIVE** parts of the dormer window structure shown.

- 1. _____
- 2. _____
- 3. _____
- 4. _____
- 5. _____



(2) (i) The window frame shown is made from uPVC. What do the letters uPVC stand for?

- u. _____
- P. _____
- V. _____
- C. _____

(ii) List **ONE** advantage and **ONE** disadvantage of using uPVC.

Advantage: _____

Disadvantage: _____

(b) (1) The wooden floorboards in the image have swollen as shown.

Suggest a reason why this has occurred.







Reason: _____



(2) Describe how this problem could be avoided.

Answer: _____

(b) The table below shows equipment associated with construction.
Name **EACH** item and state what it is used for.

	Item	Use
1		Name: _____ Use: _____ _____
2		Name: _____ Use: _____ _____
3		Name: _____ Use: _____ _____
4		Name: _____ Use: _____ _____
5		Name: _____ Use: _____ _____
6		Name: _____ Use: _____ _____

2. Building Services

(a) (1) Name the **FOUR** electrical items shown below and state what **EACH** is used for.



Name: _____

Use: _____



Name: _____

Use: _____



Name: _____

Use: _____



Name: _____

Use: _____

(2) Shown are typical components in a central heating system.

Name **EACH** component and give its function.



Name: _____

Function: _____



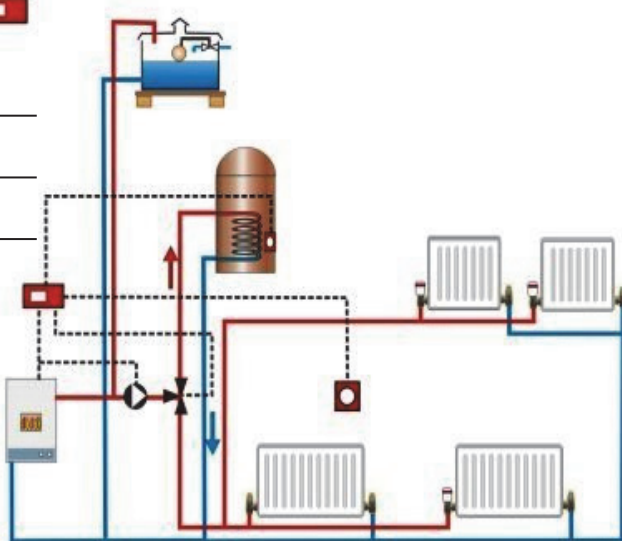
Name: _____

Function: _____



Name: _____

Function: _____



Name: _____

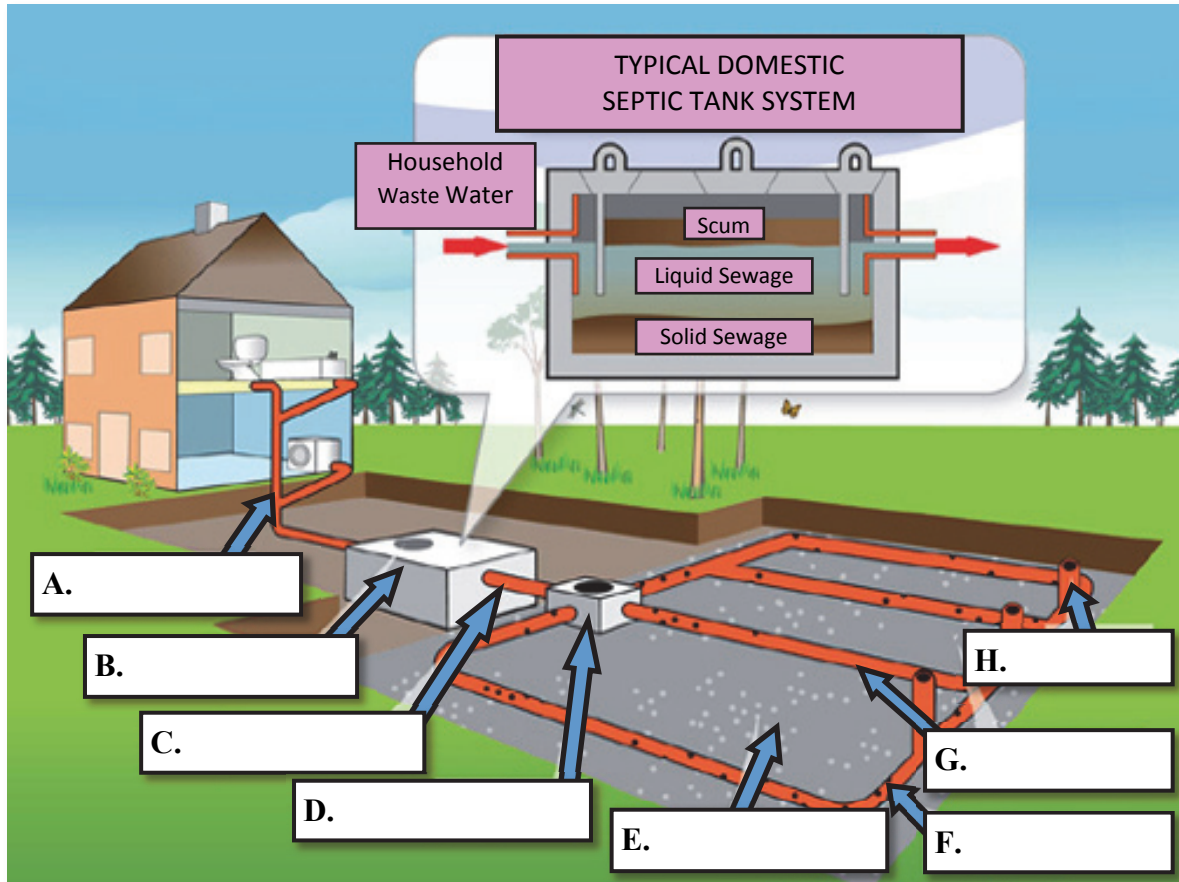
Function: _____



Name: _____

Function: _____

(b) (1) The graphic below shows a typical domestic septic tank system. Name **any FIVE** of the components shown.



(2) Identify the **TWO** components shown below and describe their function.



Name: _____

Function: _____



Name: _____

Function: _____

(c) List **TWO** appropriate uses for *Harvested Rainwater*.

1. _____

2. _____



3. Woodcraft

(a) (1) Three types of woodworking chisel are shown below. Name **EACH** chisel.



1. _____

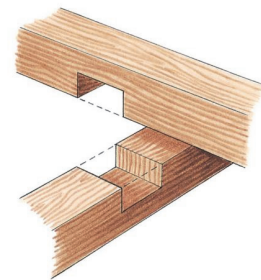


2. _____



3. _____

(2) Shown opposite is a cross halving joint.
Describe, using *notes and sketches*, the steps involved in removing the wood from one trench.



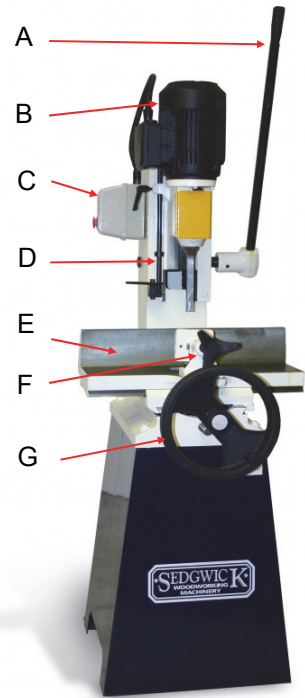
Sketch (in pencil)		Description
1.		<hr/> <hr/> <hr/>
2.		<hr/> <hr/> <hr/>
3.		<hr/> <hr/> <hr/>
4.		<hr/> <hr/> <hr/>

(b) (1) Name the woodworking machine shown.

Name: _____

Name **any FIVE** of the labelled parts.

	Name
A	
B	
C	
D	
E	
F	
G	



(2) List **TWO** safety precautions to be observed when using this machine.

1. _____ 2. _____

(c) Name the **FOUR** woodworking components shown below.



Name: _____



Name: _____



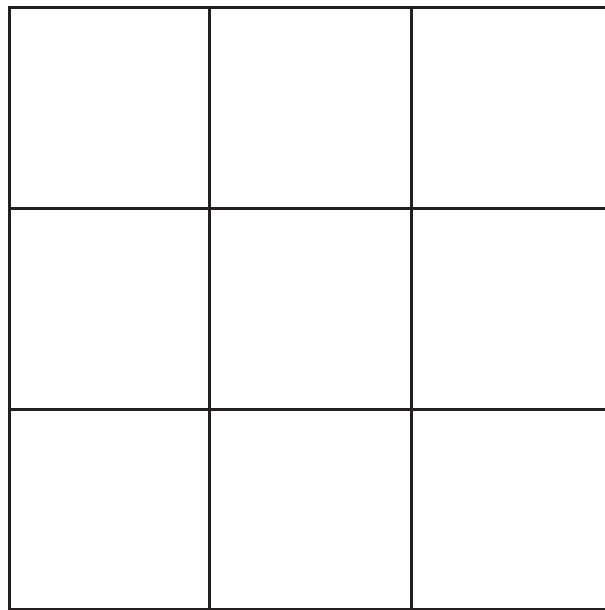
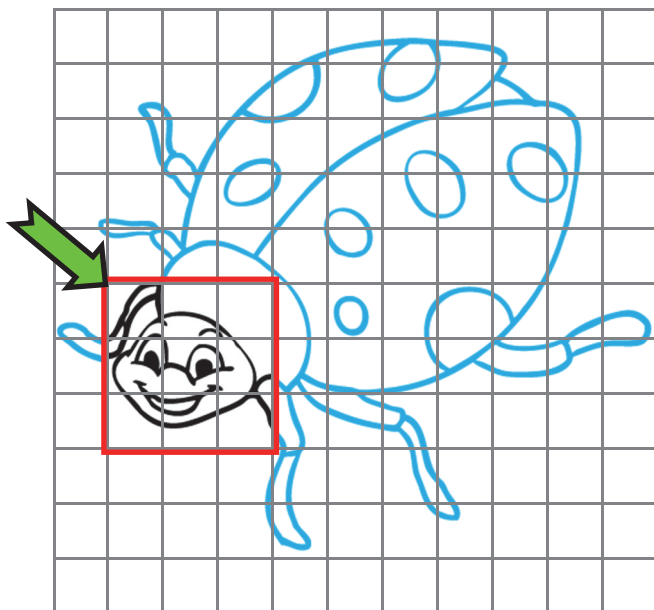
Name: _____



Name: _____

4. Design and Manufacture of Educational Toys

- (a) (1) The image below is to be enlarged using a grid. In the grid on the right redraw the portion of the ladybird that is outlined in red.



- (2) Shown on the right is a jig saw puzzle in the shape of a ladybird.

Name a suitable saw for cutting the curves.

Saw: _____

- (3) Why is accuracy important when cutting the curves?

Reason: _____

- (4) List **TWO** safety precautions to be observed when applying a surface finish to a child's wooden toy.

1. _____

2. _____



(b) Name the mechanism used to move or lift the parts in **EACH** toy shown below.



1. _____ 2. _____



3. _____

(c) (1) A child's toy often has more than one function to keep the child engaged.
Explain what you think happens when the toy shown below is pulled along.

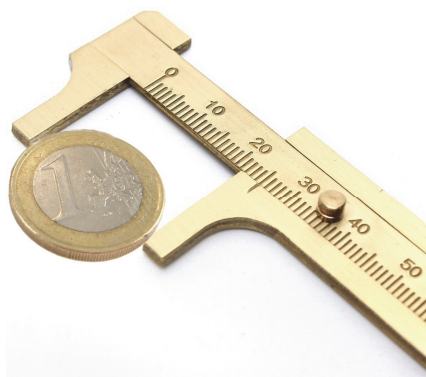


(2) Make a neat freehand sketch of a secondary movement mechanism that could be incorporated into an educational toy.



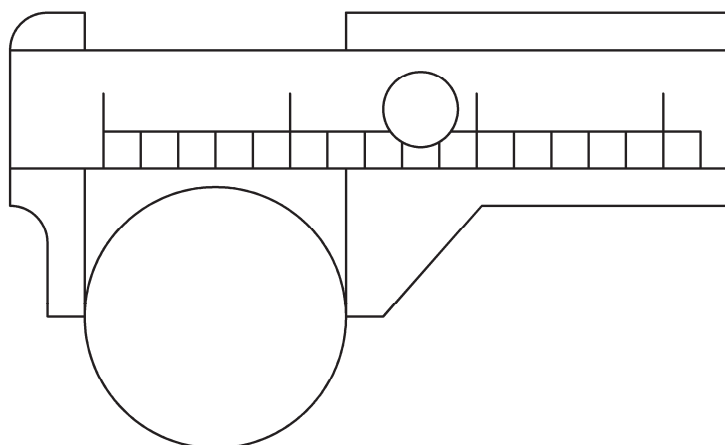
5. Computer Aided Design

(a) The image on the right shows a caliper measuring tool which is commonly used in engineering and construction. A CAD drawing of a portion of the tool is shown below. Using a ruler to measure, neatly insert on the drawing, an example of **EACH** of the following types of CAD dimension:



- (i) Linear Dimension (Horizontal)
- (ii) Linear Dimension (Vertical)
- (iii) Leader Dimension
- (iv) Angular Dimension
- (v) Radius Dimension
- (vi) Diameter Dimension.

(Arrowheads, extension lines, text, etc. should be neatly included.)



(b) It is essential to backup Computer Aided Design (CAD) files in order to recover valuable data in the event of a computer crashing.

Describe **TWO** modern systems of data backup and briefly outline an advantage and a disadvantage of **EACH** system.



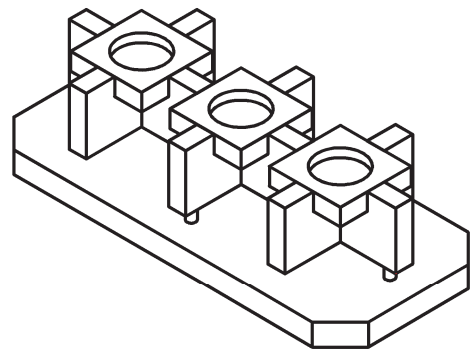
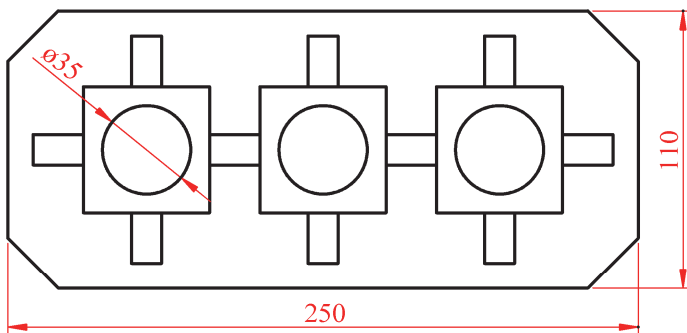
	Backup System	Advantage	Disadvantage
1	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
2	_____	_____	_____
	_____	_____	_____
	_____	_____	_____

(c) (1) Name a CAD package that you have used while studying Graphics and Construction Studies.

Package: _____

(2) Is the CAD package: Parametric or Non-Parametric?

(3) List **FOUR** CAD commands/tools/features used to produce the plan and isometric CAD drawing of the Tea-Light Holder shown below. Briefly explain what **EACH** command/tool/feature does.



Command/Tool/Feature		What it does
1	_____	_____ _____ _____
2	_____	_____ _____ _____
3	_____	_____ _____ _____
4	_____	_____ _____ _____

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