



**Coimisiún na Scrúduithe Stáit**  
**State Examinations Commission**

**Leaving Certificate Applied 2013**

**Marking Scheme**

**Graphics and Construction Studies**

**Common Level**

### **Note to teachers and students on the use of published marking schemes**

Marking schemes published by the State Examinations Commission are not intended to be standalone documents. They are an essential resource for examiners who receive training in the correct interpretation and application of the scheme. This training involves, among other things, marking samples of student work and discussing the marks awarded, so as to clarify the correct application of the scheme. The work of examiners is subsequently monitored by Advising Examiners to ensure consistent and accurate application of the marking scheme. This process is overseen by the Chief Examiner, usually assisted by a Chief Advising Examiner. The Chief Examiner is the final authority regarding whether or not the marking scheme has been correctly applied to any piece of candidate work.

Marking schemes are working documents. While a draft marking scheme is prepared in advance of the examination, the scheme is not finalised until examiners have applied it to candidates' work and the feedback from all examiners has been collated and considered in light of the full range of responses of candidates, the overall level of difficulty of the examination and the need to maintain consistency in standards from year to year. This published document contains the finalised scheme, as it was applied to all candidates' work.

In the case of marking schemes that include model solutions or answers, it should be noted that these are not intended to be exhaustive. Variations and alternatives may also be acceptable. Examiners must consider all answers on their merits, and will have consulted with their Advising Examiners when in doubt.

### **Future Marking Schemes**

Assumptions about future marking schemes on the basis of past schemes should be avoided. While the underlying assessment principles remain the same, the details of the marking of a particular type of question may change in the context of the contribution of that question to the overall examination in a given year. The Chief Examiner in any given year has the responsibility to determine how best to ensure the fair and accurate assessment of candidates' work and to ensure consistency in the standard of the assessment from year to year. Accordingly, aspects of the structure, detail and application of the marking scheme for a particular examination are subject to change from one year to the next without notice.



# Coimisiún na Scrúduithe Stáit

## State Examinations Commission

*Leaving Certificate Applied, 2013*

# Vocational Specialism

## Graphics and Construction Studies

**(240 marks)**

Sample solutions shown are presented as example answers.  
All other valid solutions are acceptable and are marked accordingly.

*Tuesday, 11<sup>th</sup> June, Morning, 9:30 - 11:00*

### General Directions

1. Write your examination number in this space:

2. 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 three**.

**135 marks**

**Q1** - Construction

**Q2** - Building Services

**Q3** - Woodcraft

**Q4** - Design and Manufacture  
of Educational Toys

**Q5** - Computer Aided Design

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

For the Examiner only	
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 plus 4)
<b>Note:</b> The mark in row 3 (or row 5 if Irish bonus is awarded) must equal the mark in the Total mark box on the script.	

For the Superintendent only			
Centre Stamp			
Section		Question	Mark
1	(Both)	1	
		2	
2	(Any 3)	1	
		2	
		3	
		4	
		5	
<b>Total</b>			

# Section 1

# COMPULSORY QUESTION 1

(60 Marks)

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

- (a) The diagram shows a device found in most workshops.  
Name this device.

Name: Bench Grinder **3 Marks**

What is the function of the part labelled A in the diagram?

Function: Safety - To deflect sparks etc. **2 Marks**



- (b) The image below shows a wall mounted shelving unit. In the space provided, sketch a suitable joint for joining the shelf to the side as indicated by the circle.



**5 Marks**  
(Deduct 1 mark if not in pencil)



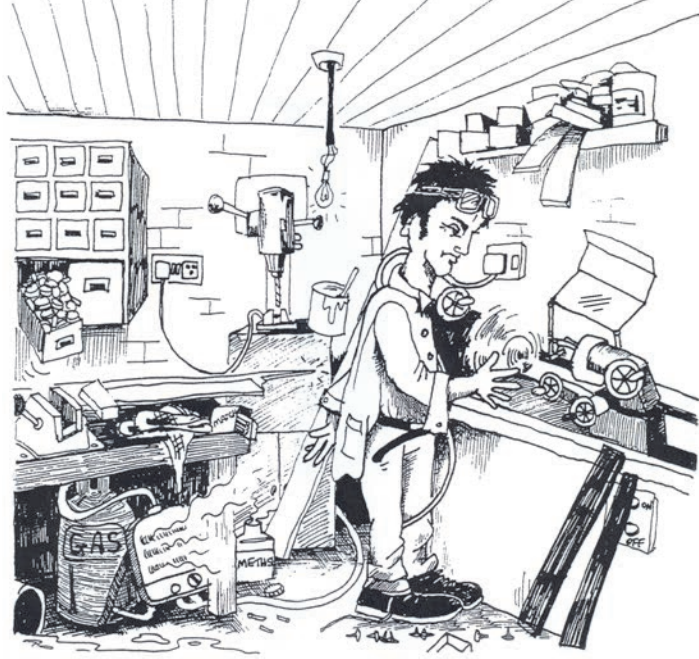
- (c) Mortar is a mixture of materials which is used in the construction of walls.

Name the **TWO** main materials which are mixed with water to form mortar.



Water + Sand **3 Marks** + Cement **2 Marks** = Mortar

(d) Identify **FIVE** safety hazards in the workshop shown on the right.



1. \_\_\_\_\_ **1 Mark**
2. \_\_\_\_\_ **1 Mark**
3. \_\_\_\_\_ **1 Mark**
4. \_\_\_\_\_ **1 Mark**
5. \_\_\_\_\_ **1 Mark**

(e) Name the piece of construction equipment shown.

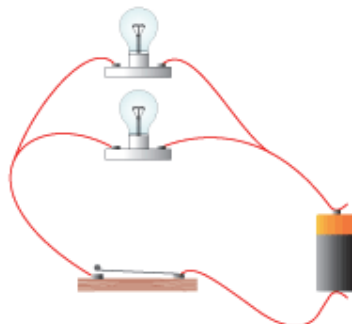
Name: \_\_\_\_\_ **2 Marks**

Describe what it is used for:

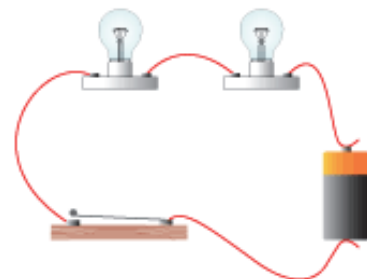
\_\_\_\_\_ **3 Marks**  
 \_\_\_\_\_



(f) Name the **TWO** types of electrical circuit shown on the right.



1. Parallel **2 Marks**

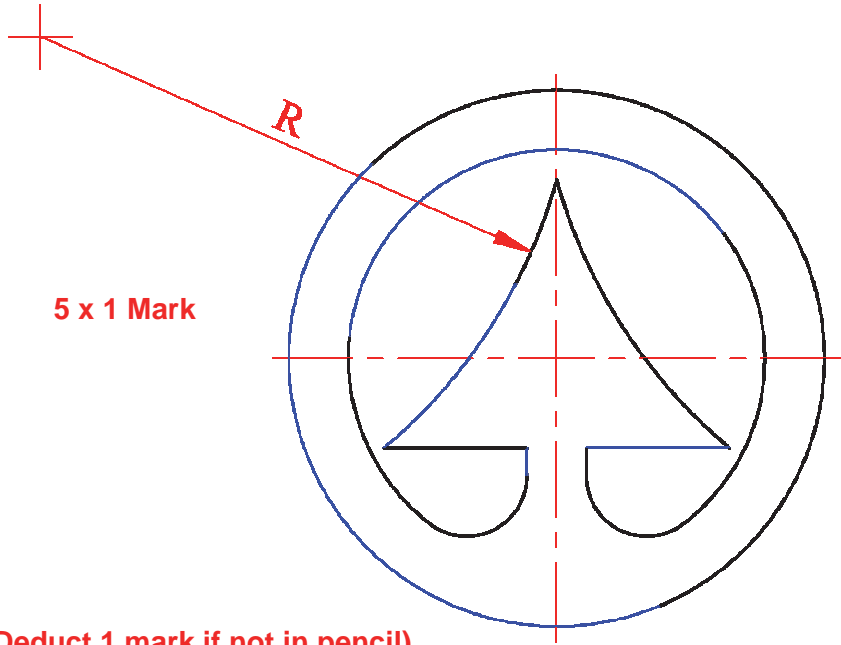


2. Series **3 Marks**

(g) The logo below is based on lines and circles.  
 Complete the drawing of the logo on the right.  
 (You need not include the text shown underneath the logo.)



**SPAR**



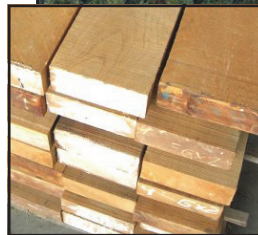
(Deduct 1 mark if not in pencil)



USE A  
**COMPASS**  
 AND PENCIL  
 ONLY

(h) Planks of solid wood are often produced from trees when they are felled.

List **THREE** products, other than solid wood, that can be produced from trees.



1. \_\_\_\_\_ **2 Marks**

2. \_\_\_\_\_ **2 Marks**

3. \_\_\_\_\_ **1 Mark**

(i) When designing and making a project it is important to produce a design portfolio to accompany it.

List **FOUR** headings that you should include in such a design portfolio:



1. \_\_\_\_\_ **2 Marks**

3. \_\_\_\_\_ **1 Mark**

2. \_\_\_\_\_ **1 Mark**

4. \_\_\_\_\_ **1 Mark**



- (j) A bird house is shown on the right.  
Name a wood working tool that could be used to cut out the shape of the bird.

Name: \_\_\_\_\_ **2 Marks**

In the space provided below sketch this tool.

**3 Marks**  
**(Deduct 1 mark if not in pencil)**



- (k) Explain what is meant by the term **solar heat gain**, with regard to house design in Ireland.

**5 Marks**

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- (l) The diagram shows a 3-core electrical cable.

Identify the **THREE** wires shown.

Yellow & Green: Earth **1 Mark**

Blue: Neutral **1 Mark**

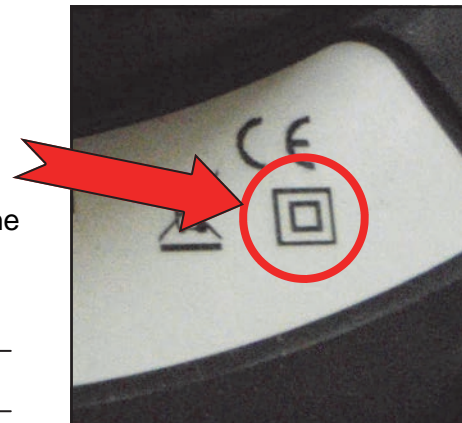
Brown: Live **1 Mark**



The image on the right shows an enlarged view of the handle of an electrical item.

Explain what the electrical symbol, highlighted by the circle, means.

The device is Double Insulated **2 Marks**



- (m) A Builders Supply company charges 10% of the cost of the total order of items as a delivery charge.

A customer orders 2 sheets of plasterboard at a cost of €20 per sheet and 10 bags of 'skimcoat' plaster at a cost of €12 per bag.

Calculate the total cost to the customer for the above order, including delivery.



$$2 \times \text{€}20 = \text{€}40 \quad (1 \text{ Mark})$$

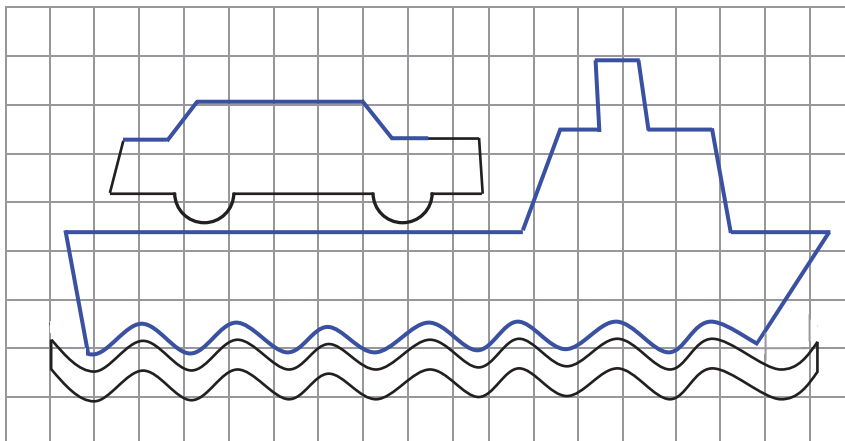
$$10 \times \text{€}12 = \text{€}120 \quad (1 \text{ Mark})$$

$$\text{Materials Total} = \text{€}160 \quad (1 \text{ Mark})$$

$$\text{Delivery } \text{€}160 \times .10 = \text{€}16 \quad (1 \text{ Mark})$$

$$\text{Overall Total} = \text{€}176 \quad (1 \text{ Mark})$$

- (n) The image on the right shows a sign for a ferry. An enlarged drawing of the ferry sign has been partly completed on the grid below. Complete the drawing.



Boat = 4 Marks  
Car = 1 Mark

(Deduct 1 mark if not in pencil)



- (o) In the production of furniture, what do the letters **CAM** stand for?

C: Computer 1 Mark

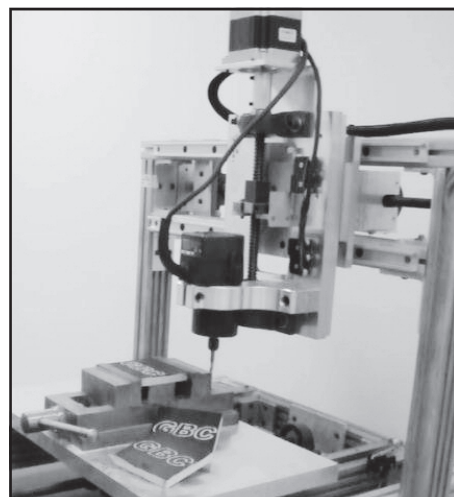
A: Aided 1 Mark

M: Manufacture 1 Mark

List **TWO** advantages of this type of production.

1. \_\_\_\_\_ 1 Mark

2. \_\_\_\_\_ 1 Mark





**Section 1**

**COMPULSORY  
QUESTION 2**

**(45 Marks)**

**2. Graphic Communication**

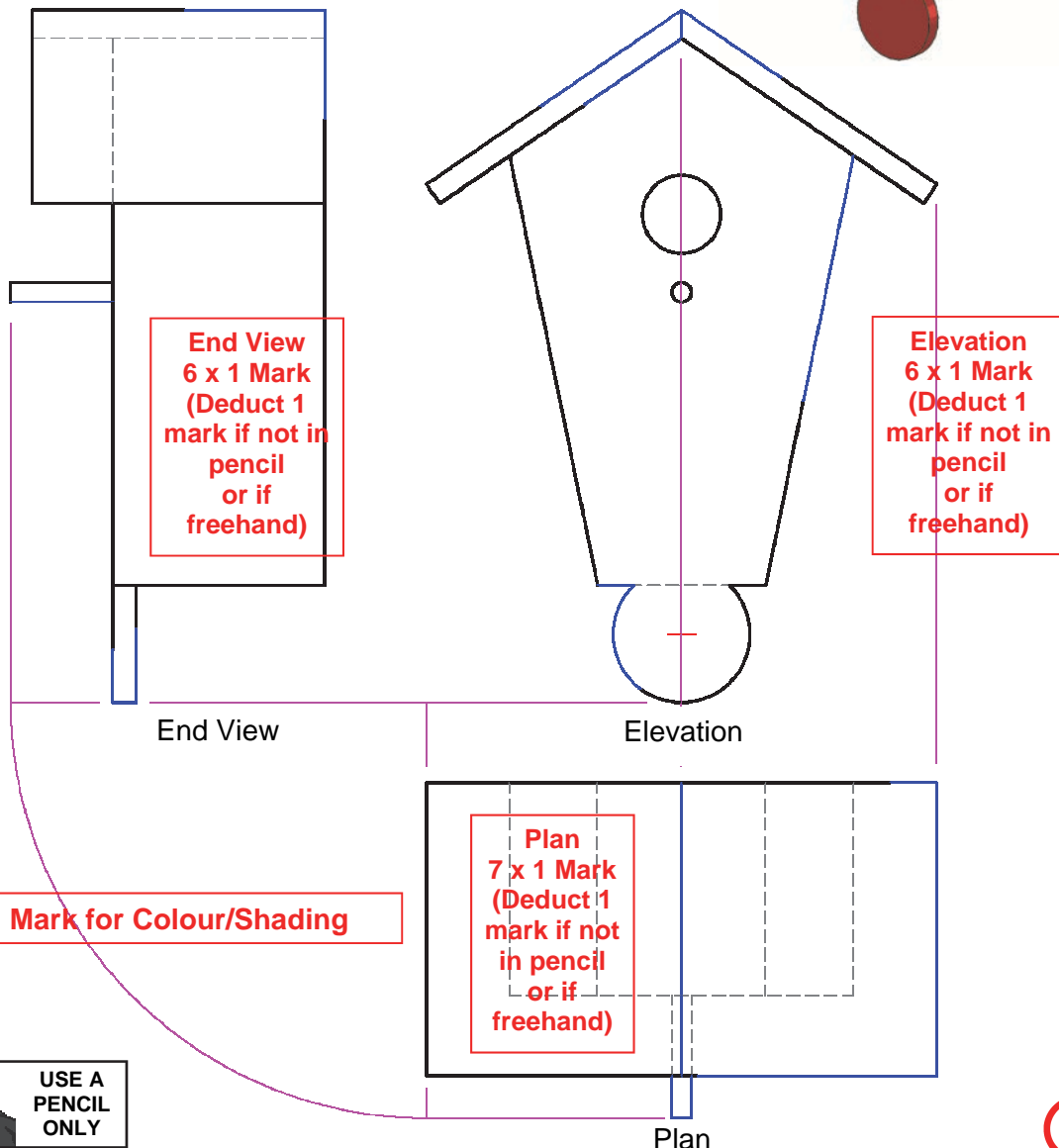
(a) The graphic on the right shows a pictorial view of a Bird House.



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

*(Some hidden detail has been omitted for clarity and no hidden detail is necessary.)*

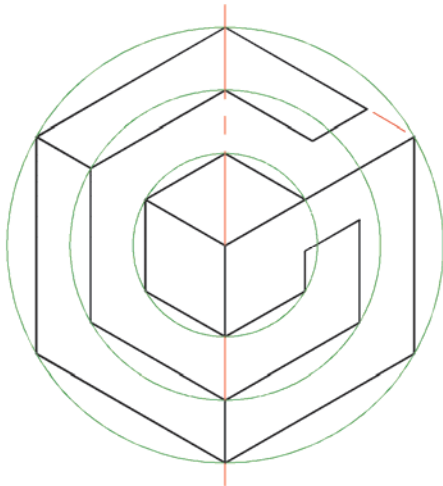
(2) Apply appropriate colour or shading to the **Completed Views** to enhance the drawing.



- (b) The image on the right shows the logo for a games console. The logo is based on a series of hexagons. The smaller drawing below illustrates how the logo is drawn using three construction circles. Use this information to complete the larger version of the logo at the bottom of the page.

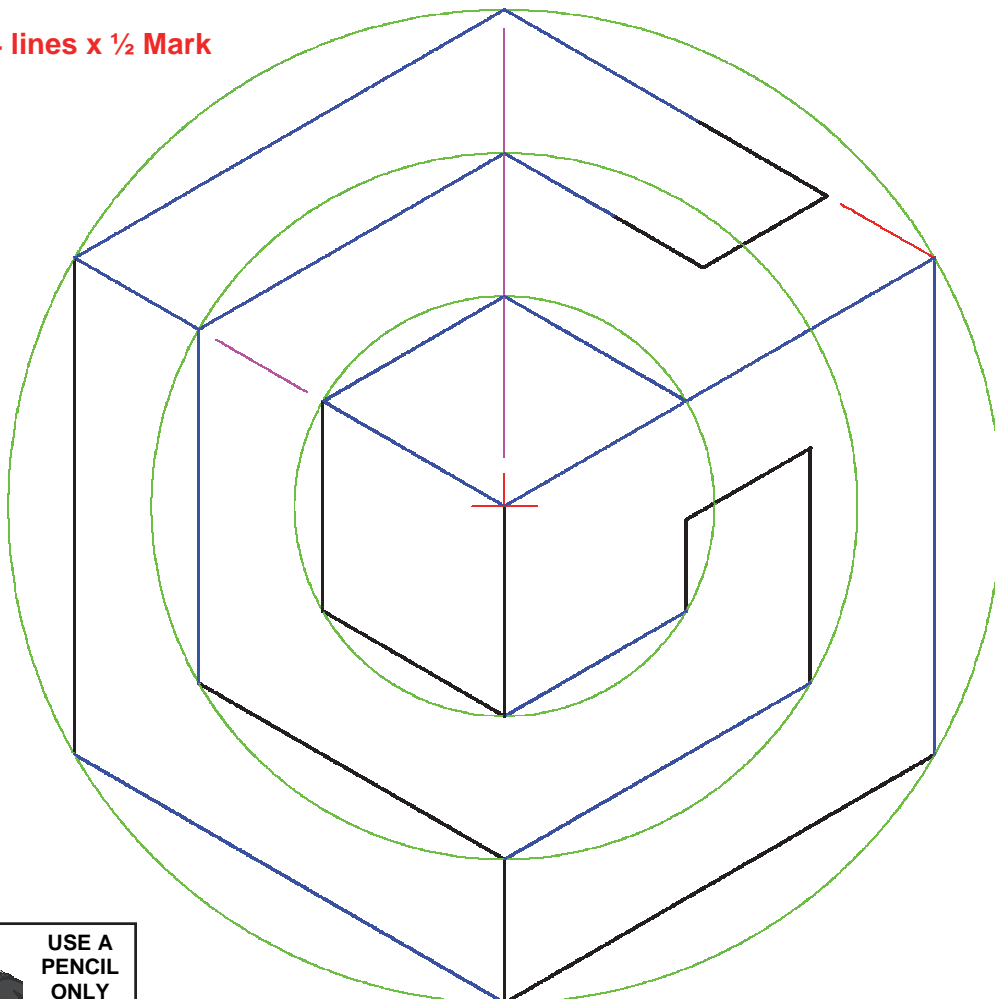


N I N T E N D O  
G A M E C U B E



**7 Marks in Total**  
**(Deduct 1 marks if not in pencil**  
**or if freehand)**

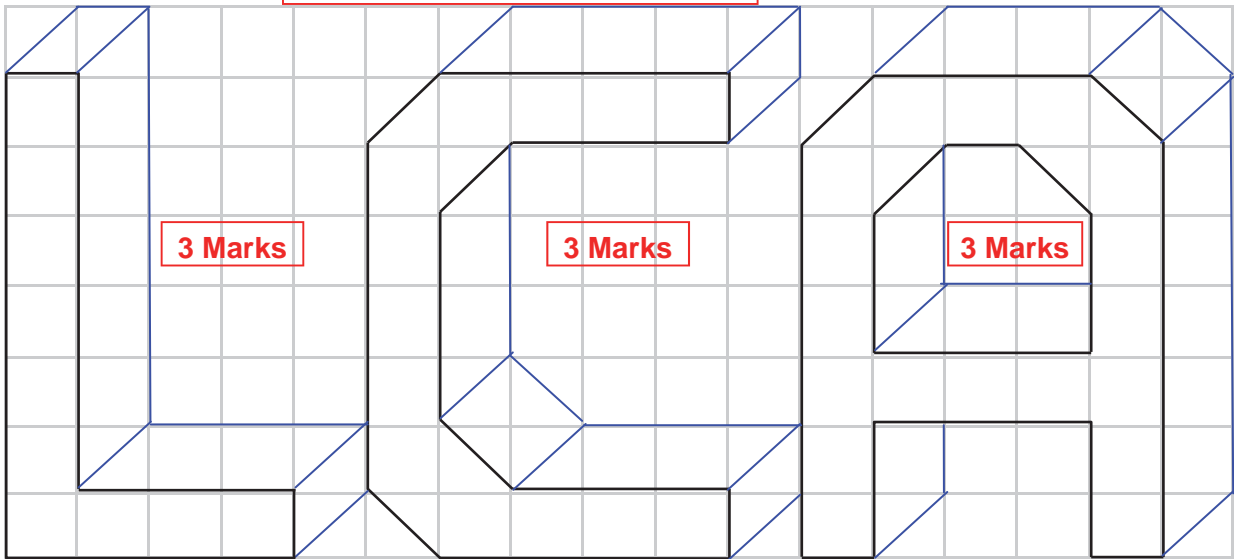
**14 lines x 1/2 Mark**



7

(c) (1) Complete the oblique drawing of the letters **LCA** on the grid below. Apply colour or shading to enhance the drawing.

**1 Mark for Colour/Shading**



**3 Marks**

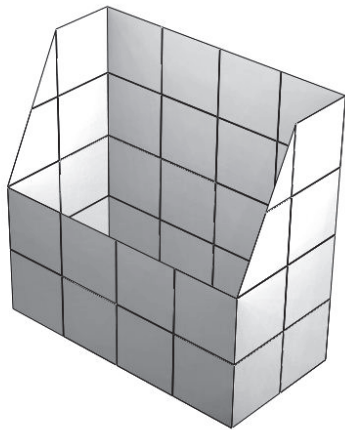
**3 Marks**

**3 Marks**

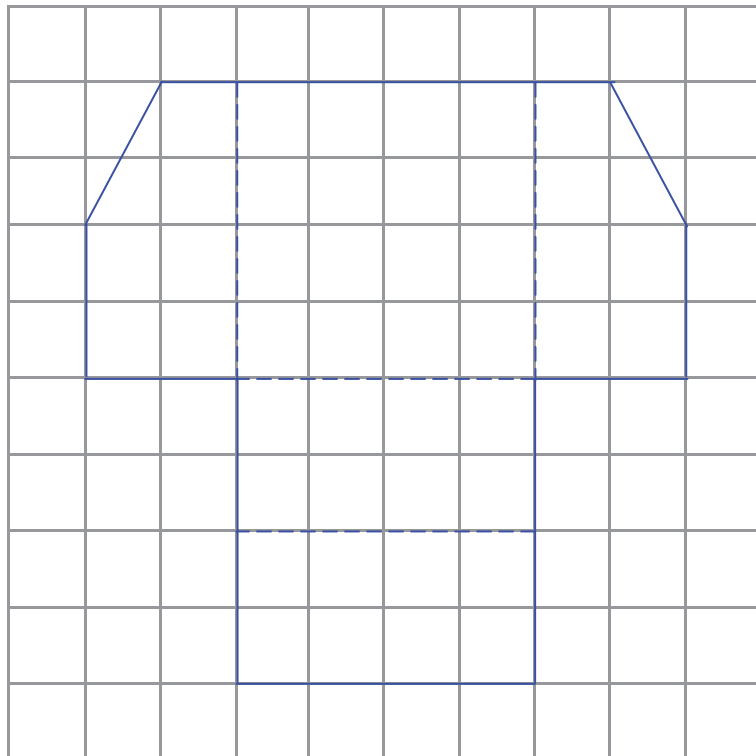
**10 Marks in Total  
(Deduct 1 mark if not in pencil or if freehand)**



(c) (2) Draw the development of the magazine holder shown below on the grid provided.



**Rectangles = 3 x 1 Mark  
Sides = 2 x 2 Marks  
Fold Lines = 1 Mark**



**8 Marks in Total (Deduct 1 mark if not in pencil or if freehand)**

**18**

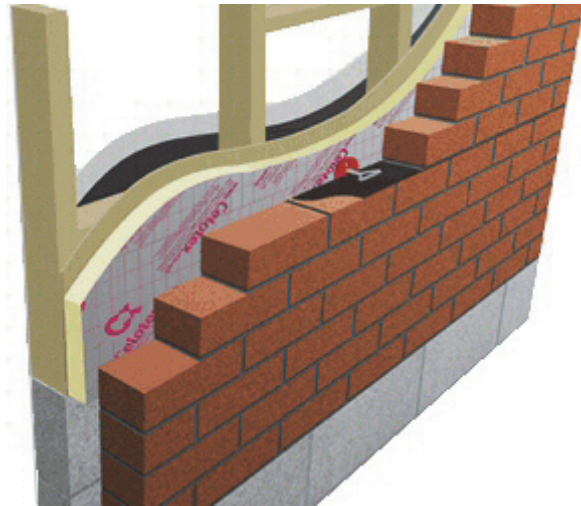
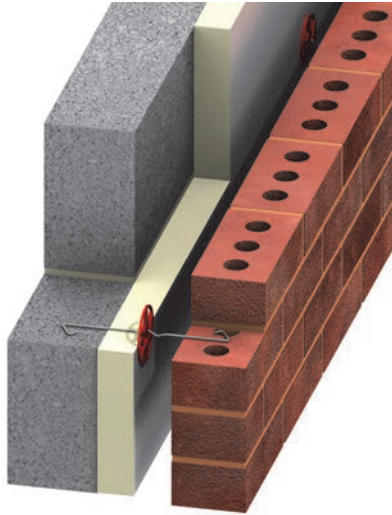
## Section 2

(135 Marks)

Answer ANY THREE questions from this section.

### 1. Construction

(a) Name the **TWO** types of wall construction shown below.



1. **4 Marks**

2. **3 Marks**

List **ONE** advantage and **ONE** disadvantage of each type of construction.

Advantage: **2 Marks** \_\_\_\_\_ Advantage: **2 Marks** \_\_\_\_\_

\_\_\_\_\_

Disadvantage: **2 Marks** \_\_\_\_\_ Disadvantage: **2 Marks** \_\_\_\_\_

\_\_\_\_\_

15

(b) (1) You must apply for planning permission before building. Briefly explain why such planning control is necessary.

Reason: **7 Marks** \_\_\_\_\_

\_\_\_\_\_

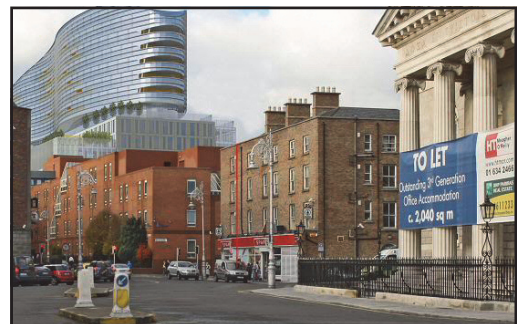
(2) Explain what is meant by **Outline** Planning Permission and **Full** Planning Permission.

Outline Planning Permission: **4 Marks** \_\_\_\_\_

\_\_\_\_\_

Full Planning Permission: **4 Marks** \_\_\_\_\_

\_\_\_\_\_



15

- (c) The dotted rectangle below shows the perimeter walls of a bedroom. The bedroom measures 3m x 4m. Sketch, to scale of 1:20, a typical bedroom layout. Indicate the position of a door, a window, a radiator, a light, a single bed, a bedside locker, a wardrobe, a study table and a chair.



**15 Marks in Total  
(Deduct 1 mark if not in pencil)**

- Door: ..... 2 Marks**
- Window: ..... 2 Marks**
- Radiator: ..... 2 Marks**
- Light: ..... 2 Marks**
- Single Bed: ..... 2 Marks**
- Bedside Locker: 2 Marks**
- Wardrobe: ..... 1 Mark**
- Study Table: ..... 1 Mark**
- Chair: ..... 1 Mark**

## 2. Building Services

- (a) Two plumbing fittings are shown below.  
(1) Give the correct name for each fitting.



Name : \_\_\_\_\_ **3 Marks**



Name : \_\_\_\_\_ **3 Marks**

- (2) Select **ONE** of the fittings above and, using notes and sketches, outline the steps involved in using the fitting to join three pipes.

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**4 Marks in Total  
(Deduct 1 mark if not in pencil)**



- (3) Clean drinking water is essential for healthy living.  
Describe how water is treated to make it safe for drinking.

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**5 Marks**





(b) (1) Explain what is meant by the term 'Fossil Fuels'.

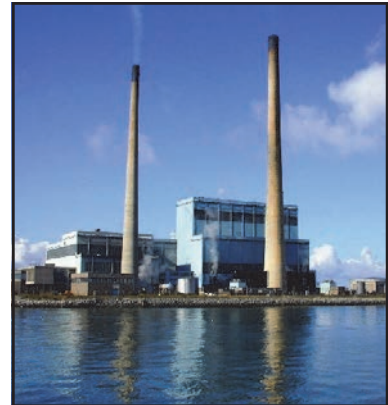
**4 Marks**

\_\_\_\_\_

\_\_\_\_\_

Name **THREE** fossil fuels that are used to generate electricity in Ireland.

1. **2 Marks**    2. **2 Marks**    3. **2 Marks**



(2) The diagrams below show two methods of treating domestic sewerage.

Name **EACH** method and give an advantage of **EACH**.



Name: **1 Mark**

Advantage: **2 Marks**

\_\_\_\_\_



Name: **1 Mark**

Advantage: **2 Marks**

\_\_\_\_\_

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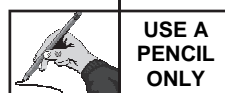
(c) The thermal image on the right shows heat loss from a house.

Identify **TWO** elements of a poorly insulated house through which heat loss can occur.

Describe, using a labelled diagram, how the heat loss could be reduced through each element.



Element 1: <b>3 Marks</b>	Element 2: <b>3 Marks</b>
<div style="border: 1px solid red; padding: 10px; text-align: center;"> <p><b>4 Marks</b> <b>(Deduct 1 mark if not in pencil)</b></p> </div>	<div style="border: 1px solid red; padding: 10px; text-align: center;"> <p><b>4 Marks</b> <b>(Deduct 1 mark if not in pencil)</b></p> </div>



14

### 3. Woodcraft

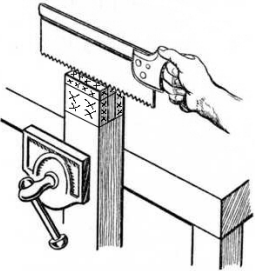
(a) The diagram shows one part of a woodwork joint.

(1) Name this part of the joint.

Name: Tenon **3 Marks**



(2) In the box below, describe using notes and sketches, the next four steps involved in sawing **one face** of this part of the joint.

	Sketch (in pencil)	Description
1.		<i>Clamp the wood upright in the vice. With the saw on the waste side of the line, saw vertically downwards to a depth of about 5mm.</i>
2.	<b>1 Mark</b>	<b>2 Marks</b> _____ _____ _____
3.	<b>1 Mark</b>	<b>2 Marks</b> _____ _____ _____
4.	<b>1 Mark</b>	<b>2 Marks</b> _____ _____ _____
5.	<b>1 Mark</b>	<b>2 Marks</b> _____ _____ _____

(b) The diagrams show two wooden outdoor items.

- (1) Name a different type of preservative for each item and the method of application you would recommend in each case.

Name: \_\_\_\_\_ **2 Marks**

Method: \_\_\_\_\_ **3 Marks**

\_\_\_\_\_

Name: \_\_\_\_\_ **2 Marks**

Method: \_\_\_\_\_ **3 Marks**

\_\_\_\_\_



- (2) List **TWO** safety precautions that should be observed when working with preservatives.

Precaution 1: \_\_\_\_\_ **3 Marks**

Precaution 2: \_\_\_\_\_ **2 Marks**

15

(c) A portable power tool is shown.

- (1) Name the power tool.

Name: Router **5 Marks**



- (2) In the space provided below, sketch a profile of a cutter that could be used in the tool to form a decorative moulding on the edge of a piece of wood.

**10 Marks**  
**(Deduct 1 mark if not in pencil)**

15

## 4. Design and Manufacture of Educational Toys

- (a) (1) The diagram shows a pull-along toy featuring a mother duck and baby ducklings.

Explain how you would transfer the design of the duck onto a piece of wood from paper.

**3 Marks**

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- (2) Name a suitable tool for cutting out the curves.

Name: **3 Marks** \_\_\_\_\_

- (3) There are three small ducklings shown in the pull along toy.

When making the toy explain how you would ensure that the shape of each one is identical.

**6 Marks**

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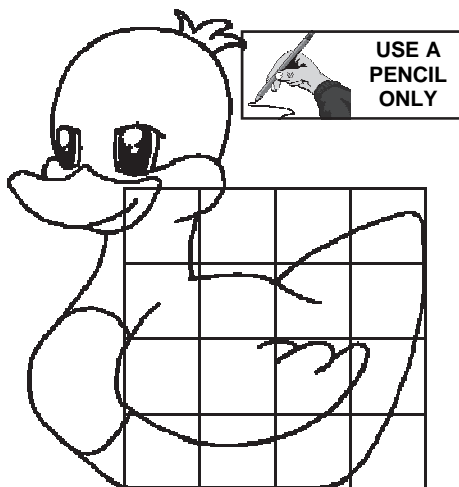


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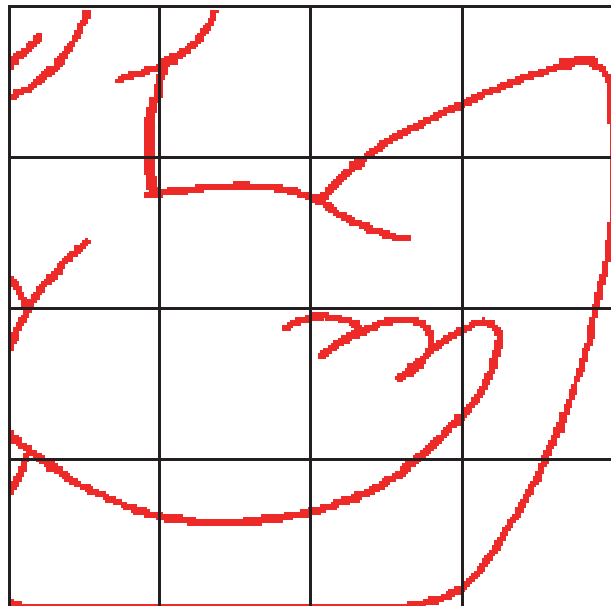


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- (4) The mother duck is an enlarged version of the baby duckling. Using the grid below, make an enlarged drawing of the section of the duck as shown.



**9 Marks**  
(Deduct 1 mark if not in pencil)



(b) Toys can be made from a variety of materials as shown. Compare the toys shown below under the given headings.

**Metal**



**Plastic**



**Wood**



	<b>Impact on the Environment</b>	<b>Durability</b>	<b>Cost</b>
<b>Metal</b>	_____ <b>2 Marks</b> _____ _____	_____ <b>2 Marks</b> _____ _____	_____ <b>2 Marks</b> _____ _____
<b>Plastic</b>	_____ <b>2 Marks</b> _____ _____	_____ <b>2 Marks</b> _____ _____	_____ <b>2 Marks</b> _____ _____
<b>Wood</b>	_____ <b>2 Marks</b> _____ _____	_____ <b>2 Marks</b> _____ _____	_____ <b>2 Marks</b> _____ _____

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(c) Safety is an important feature in the design and manufacture of children's toys. List **THREE** safety features that should be considered when designing and making a toy for a child under 3 years of age.

1. \_\_\_\_\_ **2 Marks**

\_\_\_\_\_

2. \_\_\_\_\_ **2 Marks**

\_\_\_\_\_

3. \_\_\_\_\_ **2 Marks**

\_\_\_\_\_



6

## 5. Computer Aided Design

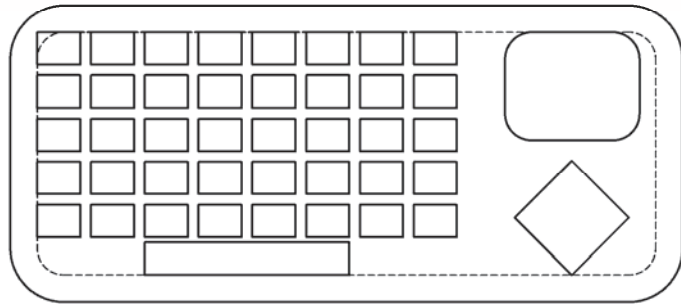
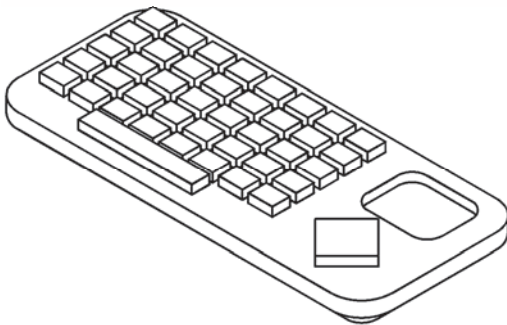
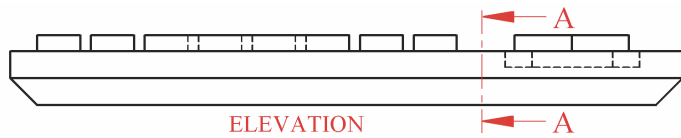
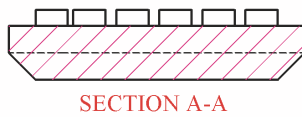
- (a) (1) Name a CAD package that you have used while studying Graphics and Construction Studies.

Package: \_\_\_\_\_ **2 Marks**

- (2) The graphic on the right shows a miniature keyboard for use with a modern Tablet Computer.

The drawing below shows the projections of a similar keyboard.

List **FIVE** CAD commands/tools/features that would be used to produce the drawings below and briefly explain what each command/tool/feature does.



Command/Tool/Feature		What it does
1	<b>1 Mark</b> _____	<b>2 Marks</b> _____ _____
2	<b>1 Mark</b> _____	<b>2 Marks</b> _____ _____
3	<b>1 Mark</b> _____	<b>2 Marks</b> _____ _____
4	<b>1 Mark</b> _____	<b>2 Marks</b> _____ _____
5	<b>1 Mark</b> _____	<b>2 Marks</b> _____ _____

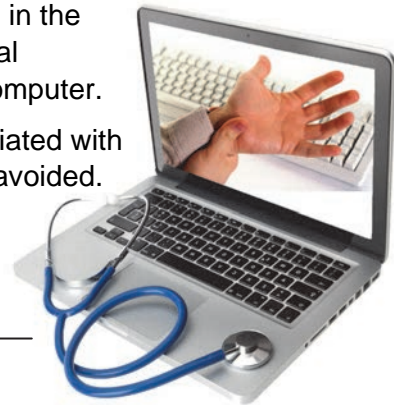


(b) (1) List **TWO** careers associated with Computer Aided Design and describe each job.



	Career	Job Description
1	<b>2 Marks</b>	<b>2 Marks</b>
2	<b>2 Marks</b>	<b>2 Marks</b>

(2) Health and safety is very important to people working in the computer industry. Repetitive Strain Injury is a medical condition which can result from prolonged use of a computer. Identify **TWO** other medical conditions that are associated with prolonged computer use and say how they might be avoided.



Condition 1: \_\_\_\_\_ **1 Mark**

Avoid by: \_\_\_\_\_ **2 Marks**

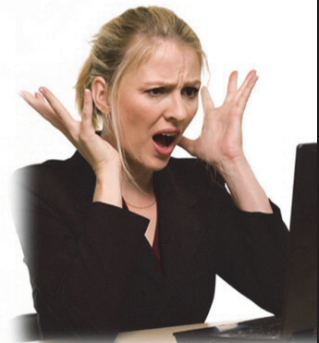
Condition 2: \_\_\_\_\_ **1 Mark**

Avoid by: \_\_\_\_\_ **2 Marks**

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(c) It is important to backup CAD files in order to avoid losing data in the event of a serious computer crash.

Describe **TWO** ways of backing up files and give a brief advantage and disadvantage of each method.



	Backup Method	Advantage	Disadvantage
1	<b>3 Marks</b>	<b>2 Marks</b>	<b>2 Marks</b>
2	<b>3 Marks</b>	<b>2 Marks</b>	<b>2 Marks</b>

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