



# Coimisiún na Scrúduithe Stáit

## State Examinations Commission

*Leaving Certificate Applied, 2014*

## Vocational Specialism

### Graphics and Construction Studies

(240 marks)

*Tuesday, 10<sup>th</sup> June, Morning, 9:30 - 11:00*

### General Directions

1. Write your examination number in this space:

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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>			



(d) A floor slab requires  $32\text{m}^3$  of ready mixed concrete.

(i) If a ready-mix truck will carry  $8\text{m}^3$  of concrete, calculate how many truck loads of concrete will be required for the floor slab.

(ii) Ready mixed concrete costs €90 per  $\text{m}^3$  plus VAT at 13.5%. Calculate the total cost to the customer of the above order.



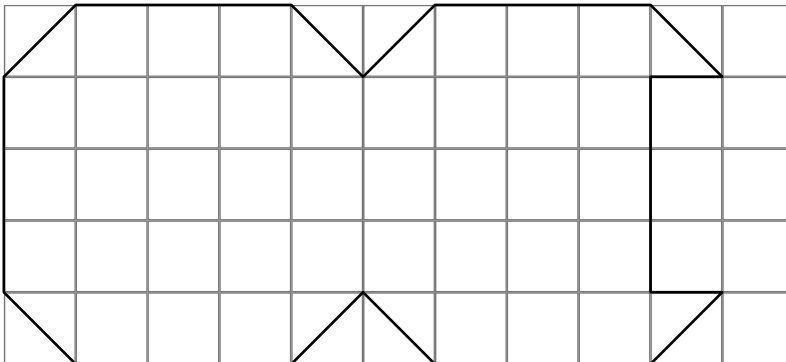
(i)

Answer: \_\_\_\_\_ Truck loads.

(ii)

Total Cost: € \_\_\_\_\_

(e) Determine the area of the patio shown below. Each square represents one square metre.



Answer:

$\text{m}^2$

(f) The text in the boxes below describes **THREE** careers in the construction industry.

Identify each career.



My work involves working with saws, hammers and drills. My job involves cutting roofs and hanging doors.

My work involves fitting pipes and getting heating systems, toilets, showers, etc. working.

My work involves drawing the plans of houses, applying for planning permission and overseeing the work.



(j) Name the tool shown.

Name: \_\_\_\_\_

Describe what it is used for.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



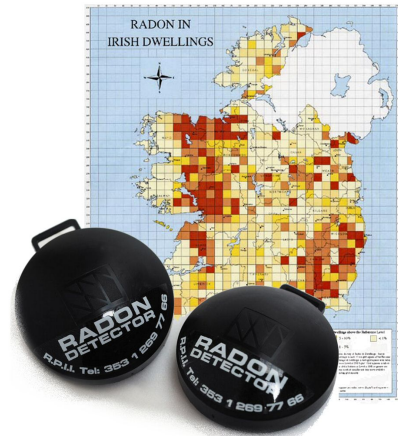
(k) A radon detector is used to detect levels of **Radon Gas** in a house.

What are the risks associated with radon gas in a house?

\_\_\_\_\_  
\_\_\_\_\_

List **TWO** items that should be installed when constructing a new dwelling to prevent radon gas from entering a house.

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



(l) The graphic shows a wooden study table.

Name **and** sketch a suitable joint for joining the rail to the leg as indicated by the circle.

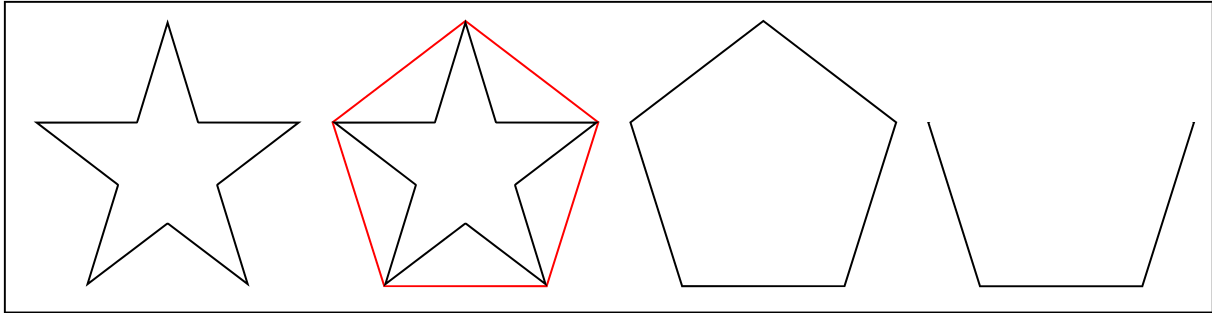
Joint: \_\_\_\_\_



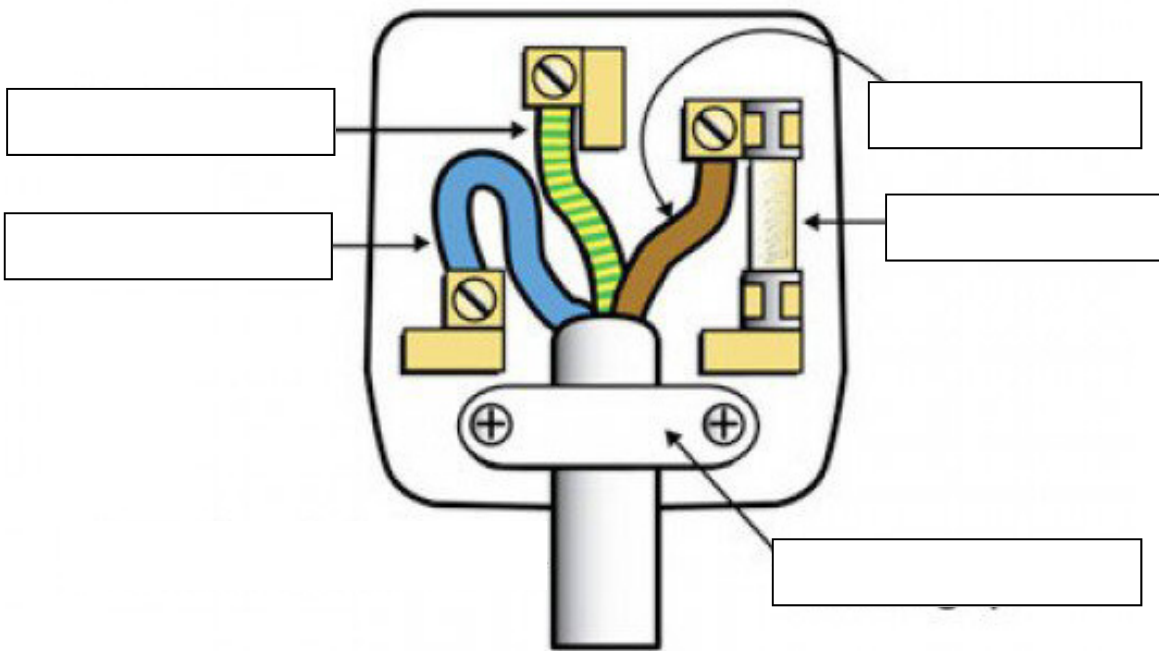
Blank area for sketching the joint.



- (m) The logo on the right is based on stars inscribed in regular pentagons. Complete the last two stars in the logo shown below.

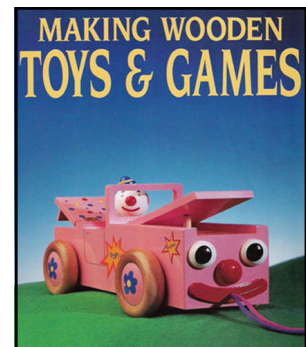


- (n) The graphic shows an open 3-pin plug. Label the parts in the boxes provided.



- (o) Give **TWO** reasons why wood is a suitable material for making toys.

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



# Section 1

# COMPULSORY QUESTION 2

(45 Marks)

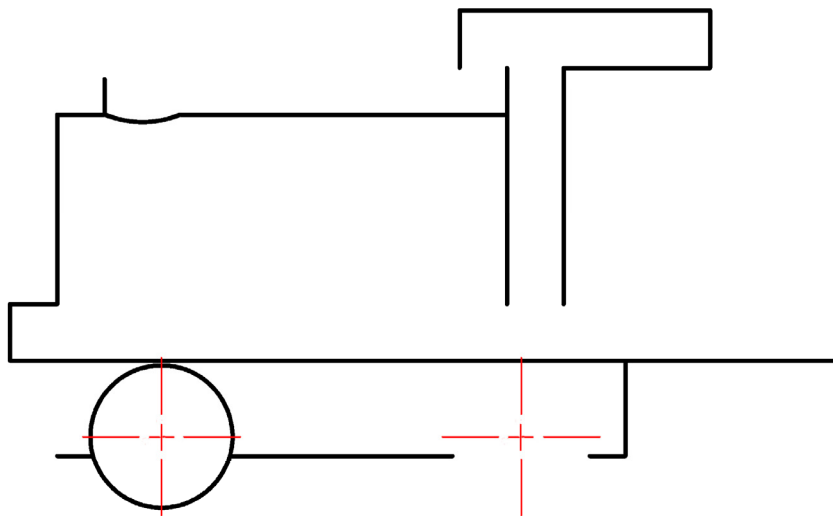
## 2. Graphic Communication

(a) The graphic on the right shows a pictorial view of a toy train.

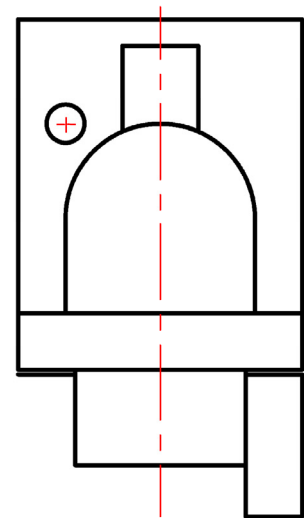
(1) Complete the Elevation, Plan and End View of the toy train on the drawing below.

*(Some hidden detail has been omitted for clarity. Hidden detail is not necessary.)*

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



Elevation



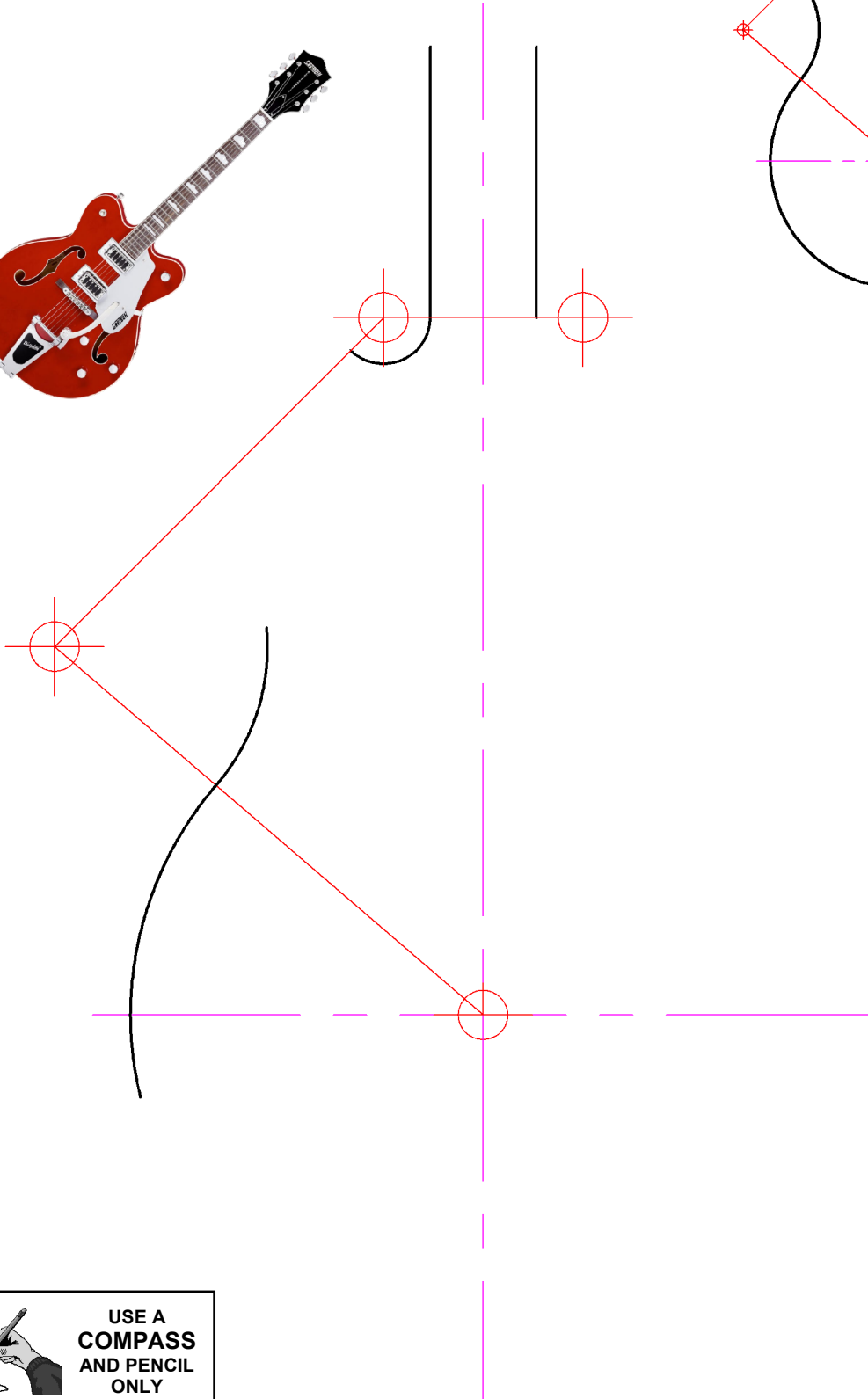
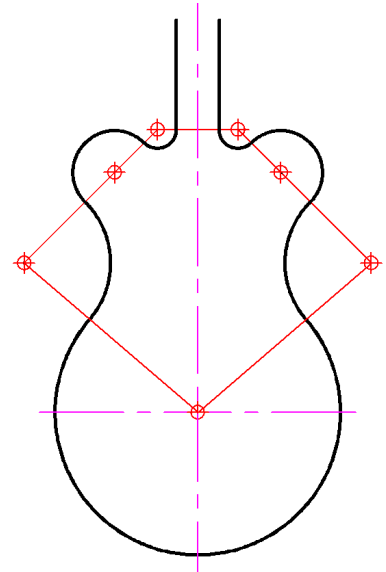
End View



Plan



- (b) The small drawing on the right shows part of a guitar based on circles in contact.
- (1) Use this information to complete the larger version of the drawing below.
  - (2) Clearly show all points of contact.

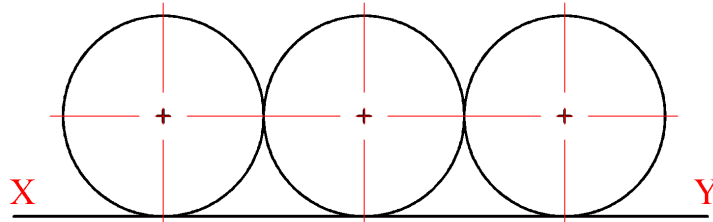




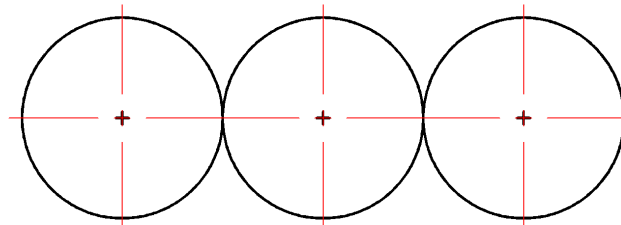
- (c) The drawing below shows the plan and elevation of three golf balls which are to be packaged in a rectangular box, similar to the one shown on the right.



- (1) In the given plan and elevation draw the smallest possible box that will hold the three balls.

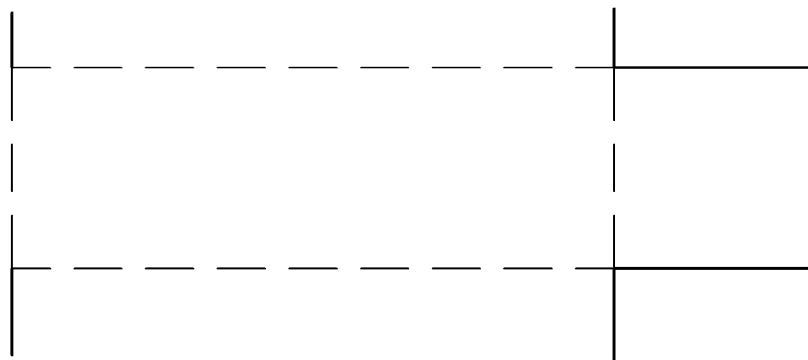


Elevation



Plan

- (2) Complete the surface development of the box. Two of the six sides have already been drawn for you. Colour or shade your finished development.



## Section 2

(135 Marks)

Answer ANY THREE questions from this section.

### 1. Construction

(a) (1) Name the roofing component shown.

Name: \_\_\_\_\_

List **FIVE** advantages of using this type of roofing component.

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



(2) Describe, using notes and sketches, another method of roof construction.

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USE A PENCIL ONLY

(b) (1) Blocklayers use the product in the plastic container shown when mixing mortar.

Name the product: \_\_\_\_\_

(2) Explain the purpose of this product.

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(c) (1) A fire safety and evacuation plan is essential in every home.

List **FIVE** important considerations when drawing up such a plan.

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



(2) Name the **THREE** pieces of fire safety equipment shown below and indicate where they should be located in the home.

			
Name			
Location			

(3) Harmful gases can build up in the home as a result of burning fossil fuels.

Name **ONE** such harmful gas:

Name: \_\_\_\_\_

Describe **TWO** safety precautions that would reduce the risks associated with this gas.

1. \_\_\_\_\_
- \_\_\_\_\_
2. \_\_\_\_\_
- \_\_\_\_\_



## 2. Building Services

(a) (1) Name the **TWO** types of plumbing pipe shown below.



Name: \_\_\_\_\_ Name: \_\_\_\_\_

(2) State which of the above types of piping you would recommend for a new house and give **TWO** reasons for your choice.

Type: \_\_\_\_\_

Reason 1: \_\_\_\_\_

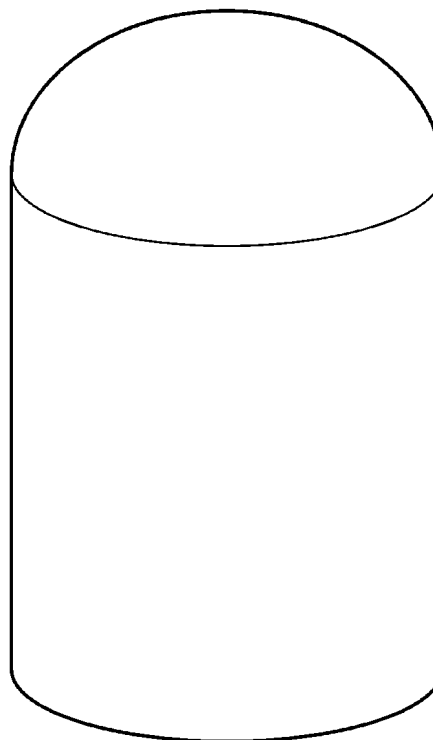
Reason 2: \_\_\_\_\_

(3) An indirect hot water storage cylinder is shown below. Such a cylinder typically includes the following parts:



1. Cold water inlet
2. Hot water outlet
3. Boiler inlet
4. Boiler outlet
5. Immersion heater
6. Heating coil

On the line diagram on the right sketch and label all of the above parts.



- (b) (1) The diagram shows a two-pipe central heating system.

Explain how the system works.

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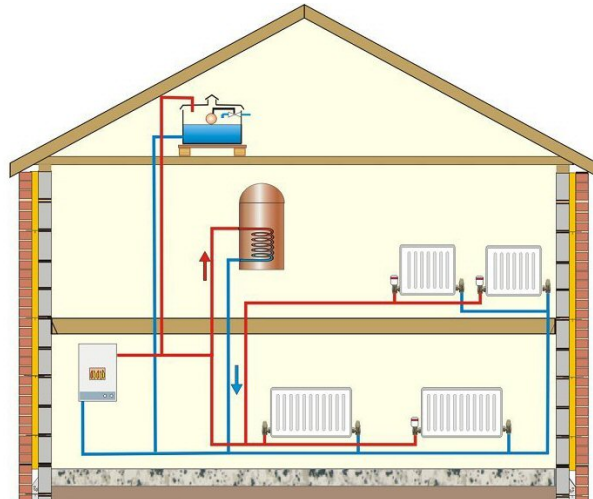
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- (2) Give **TWO** advantages of this system over a one-pipe system.

Advantage 1: \_\_\_\_\_

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Advantage 2: \_\_\_\_\_

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- (3) Describe **TWO** advantages of installing a 'zoned heating system' in a house.



Advantage 1: \_\_\_\_\_

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Advantage 2: \_\_\_\_\_

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- (c) (1) Name the **THREE** methods of generating electricity shown below.




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- (2) What is meant by the term **Renewable Energy Source**?

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### 3. Woodcraft

(a) The graphic shows a wooden countertop.

- (1) Describe in detail, using notes and sketches, how the hole for a kitchen sink would be cut out.





USE A  
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- (2) There are grooves on both sides of the sink which form a draining area. The grooves were machined using a power tool. Name and make a neat freehand sketch of this power tool.

Name: \_\_\_\_\_

- (3) List **THREE** specific safety precautions that should be observed when using this power tool.

1. \_\_\_\_\_  
\_\_\_\_\_  
2. \_\_\_\_\_  
\_\_\_\_\_  
3. \_\_\_\_\_  
\_\_\_\_\_



USE A  
PENCIL  
ONLY

- (4) Name the drill bit shown and explain what it is used for.

Name: \_\_\_\_\_

Use: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



(b) The images show various stages in the surface preparation and finishing of a wooden project. Write a short note explaining each stage.



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(c) The graphic shows a wooden cabinet with a hinged door. Explain, using labelled sketches, the steps involved in fitting the butt hinge so that it finishes flush with the surface of the wood.



## 4. Design and Manufacture of Educational Toys

(a) (1) Name the mechanism used to move or lift the parts in the toys shown below.



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



2. \_\_\_\_\_



3. \_\_\_\_\_

(2) Many toys purchased in shops today incorporate lights, sound and moving parts. Name a common source of power for these toys.

Name: \_\_\_\_\_

List two **disadvantages** of this power source.

Disadvantage 1: \_\_\_\_\_

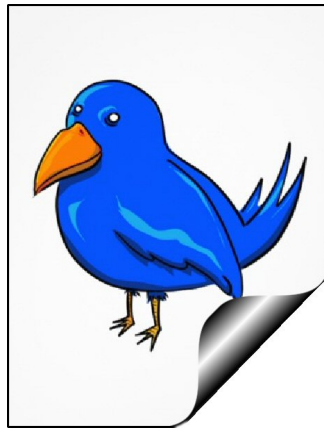
Disadvantage 2: \_\_\_\_\_

(3) Sketch a mechanism that you used in a toy that you have made.





(b) A student wishes to make a wooden toy in the shape of a bird. Explain, using notes and sketches, **ONE** method of transferring the design of the bird onto the surface of the wood.



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(c) (1) List **THREE** features of a toy that would make it appealing to a 2 to 5 year old child.

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

2. \_\_\_\_\_

3. \_\_\_\_\_

(2) Toys should be fun to play with. Give **THREE** reasons why it is beneficial that they should also have an educational value.



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

2. \_\_\_\_\_

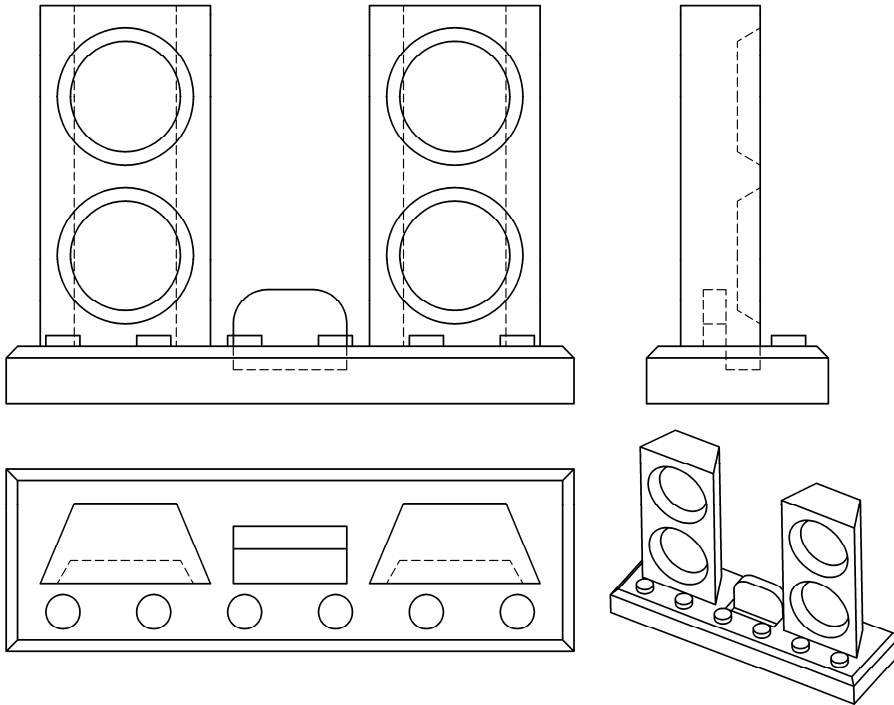
3. \_\_\_\_\_

## 5. Computer Aided Design

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

Package: \_\_\_\_\_

- (2) List **FIVE** CAD commands/tools/features that would be used to produce the drawings of the MP3 docking station below and briefly explain what each command/tool/feature does.



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

(b) (1) In the changing world of computer aided design, traditional 2D CAD systems are being rapidly replaced by parametric modelling systems. Explain the term **Parametric Modelling**.




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(2) Give **TWO** advantages of using a parametric modelling system over a traditional 2D CAD system.

Advantage 1: \_\_\_\_\_  
 \_\_\_\_\_

Advantage 2: \_\_\_\_\_  
 \_\_\_\_\_

(c) (1) In the construction industry, an architect's CAD files should always be carefully backed up. **Onsite** and **Offsite** backups should be made. Explain what is meant by each term below.



Onsite Backup means: \_\_\_\_\_  
 \_\_\_\_\_

Offsite Backup means: \_\_\_\_\_  
 \_\_\_\_\_

(2) Give an advantage and a disadvantage of each backup type and briefly state how each backup type could be achieved.

	Advantage	Disadvantage	Achieved by
<b>Onsite</b>	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
<b>Offsite</b>	_____	_____	_____
	_____	_____	_____
	_____	_____	_____

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