



Coimisiún na Scrúduithe Stáit
State Examinations Commission

Leaving Certificate Applied 2014

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, 2014

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, 10th 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)
Note: 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	
Total			

Section 1

COMPULSORY QUESTION 1

(60 Marks)

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

(a) Name the machine shown.

Name: 2 Marks _____

List **THREE** specific safety precautions that should be observed when using this machine.

1. 1 Mark _____

2. 1 Mark _____

3. 1 Mark _____



(b) Name the woodworking tool shown.

Name: 2 Marks _____

In the space provided make a freehand sketch of this tool.

3 Marks
(Deduct 1 mark if not in pencil)



(c) The **EPA** is a body responsible for environmental issues. What do the letters **EPA** stand for?

E: 1 Mark _____

P: 2 Marks _____

A: 2 Marks _____



(d) A floor slab requires 32m^3 of ready mixed concrete.

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

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



(i)

$$32/8 = 4$$

1 Mark

Answer: 4 Truck loads.

(ii) $4 \times \text{€}90 = \text{€}360$

1 Mark

$$\text{€}360 \times 0.135 = \text{€}48.60$$

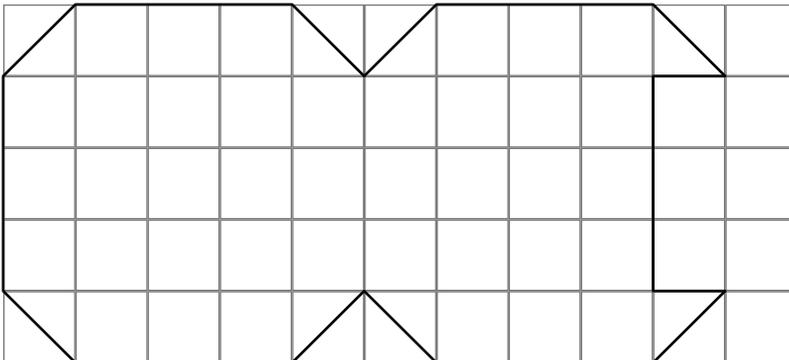
2 Marks

$$\text{€}360 + \text{€}48.60 =$$

Total Cost: € 408.60

1 Mark

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



Answer:

43 m²

5 Marks

(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.

2 Marks

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

2 Marks

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

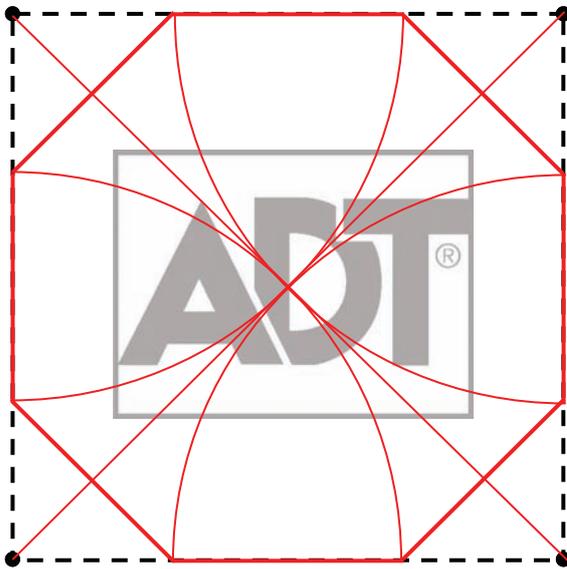
1 Mark

(g) The tree shown is a deciduous tree.
List **FIVE** characteristics of deciduous trees.

1. _____ **1 Mark**
2. _____ **1 Mark**
3. _____ **1 Mark**
4. _____ **1 Mark**
5. _____ **1 Mark**



(h) The logo shown is based on an octagon.
Inscribe an octagon in the given square below.



5 Marks
(Deduct 1 mark if not in pencil)



(i) A device used in the construction of houses is shown.

Name the item: _____ **1 Mark**

Explain using notes and sketches how the item is used.

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





(j) Name the tool shown.

Name: _____ **2 Marks**

Describe what it is used for.

_____ **3 Marks**



(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?

_____ **3 Marks**

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

1. _____ **1 Mark**
2. _____ **1 Mark**



(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: _____ **1 Mark**



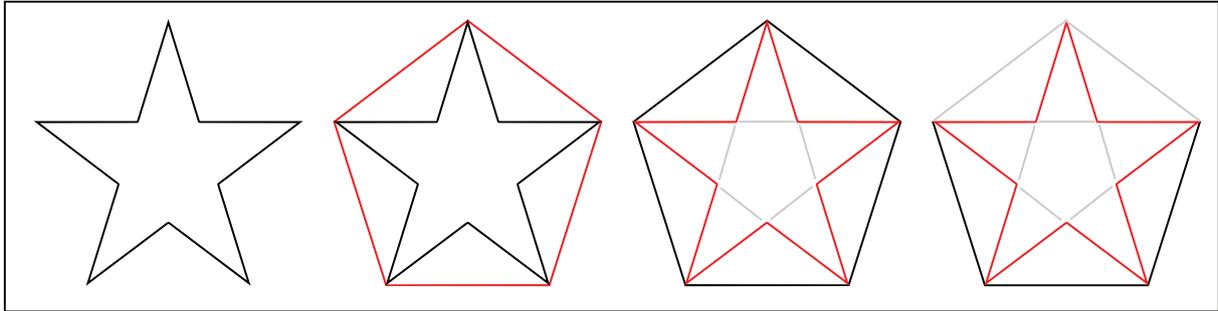
4 Marks
(Deduct 1 mark if not in pencil)



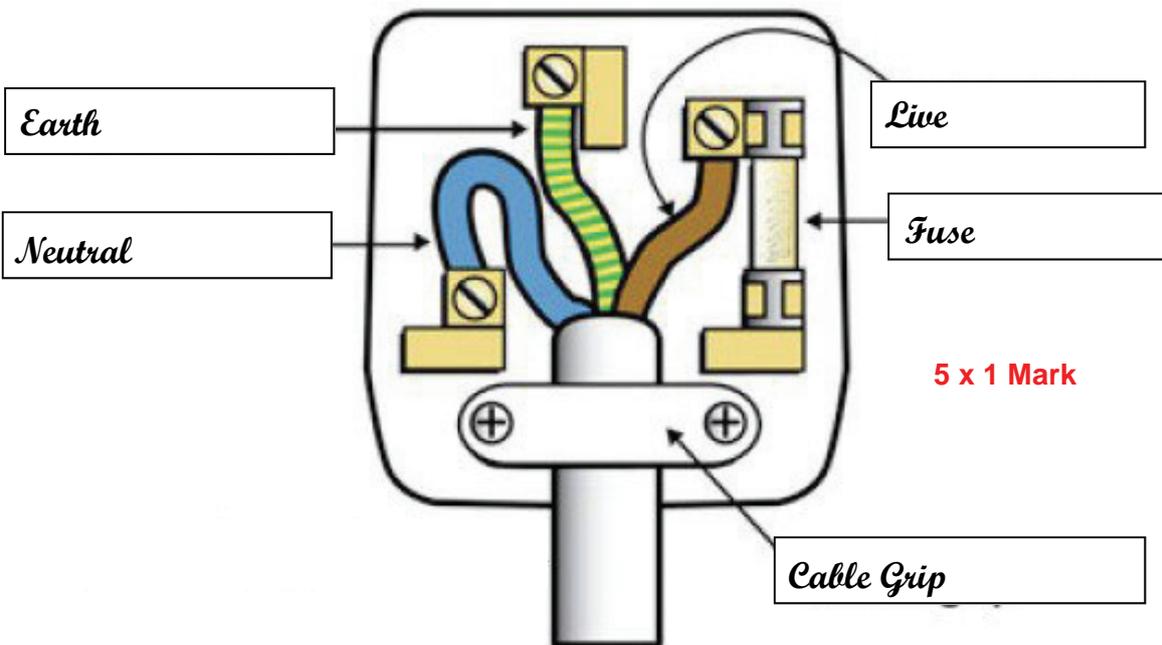
- (m) The logo on the right is based on stars inscribed in regular pentagons. Complete the last two stars in the logo shown below.



5 Marks
(Deduct 1 mark if not in pencil)



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

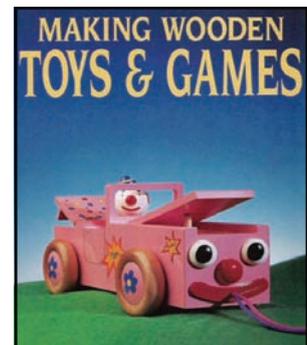


5 x 1 Mark

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

1. _____ **3 Marks**

2. _____ **2 Marks**



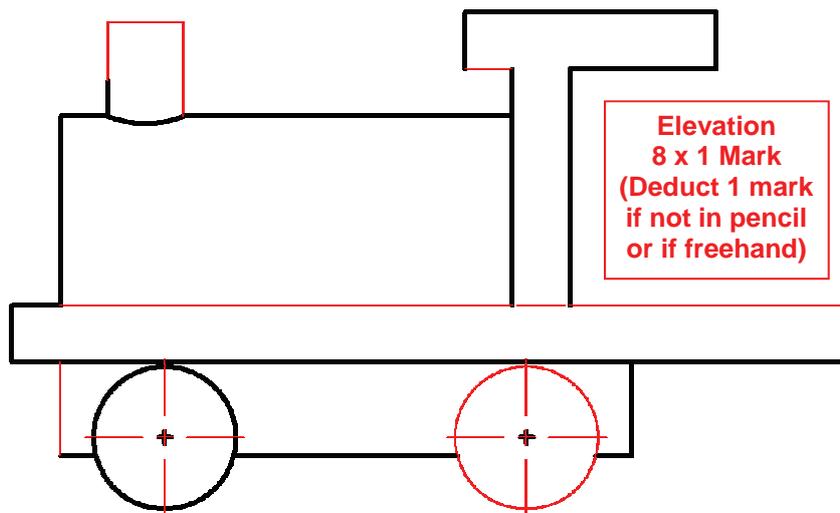
2. Graphic Communication

(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.

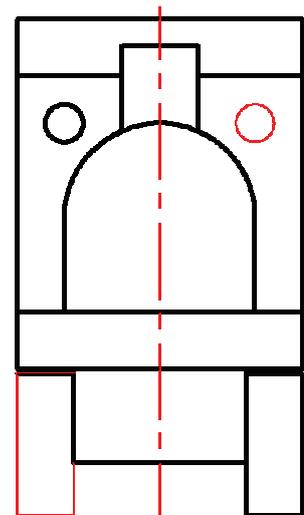
(Some hidden detail has been omitted for clarity. Hidden detail is not necessary.)

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



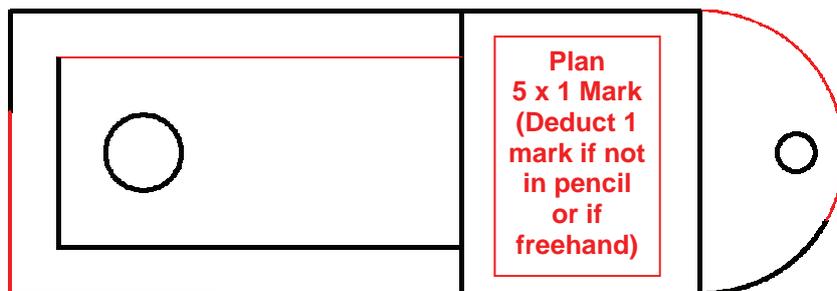
Elevation
8 x 1 Mark
(Deduct 1 mark
if not in pencil
or if freehand)

Elevation



End View

2 Marks for Colour/Shading



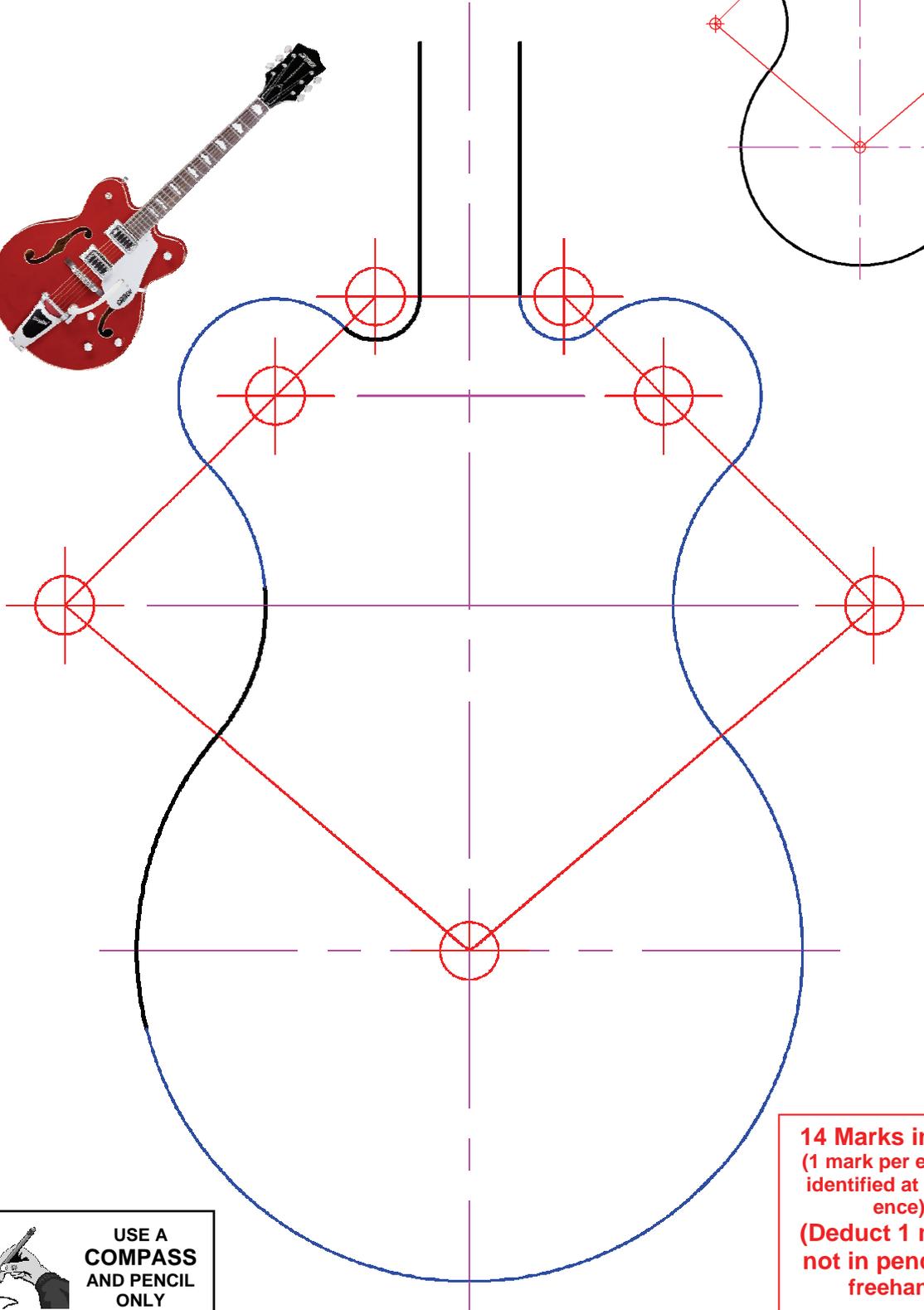
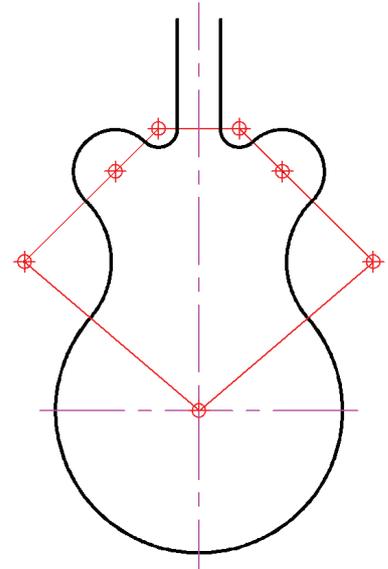
Plan
5 x 1 Mark
(Deduct 1 mark
if not in pencil
or if
freehand)

Plan

End View
5 x 1 Mark
(Deduct 1
mark if not in
pencil
or if
freehand)



- (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.

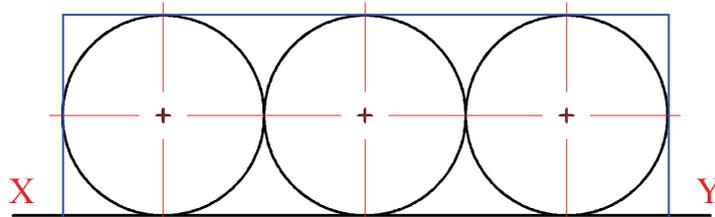


14 Marks in Total
 (1 mark per entity as identified at conference)
 (Deduct 1 mark if not in pencil or if freehand)

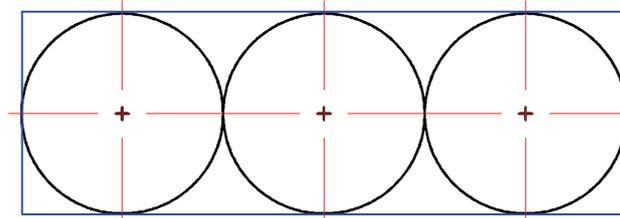
(c) The drawing below shows the plan and elevation of three golf balls which are to be packaged in a rectangular box, similar to the one shown on the right.



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



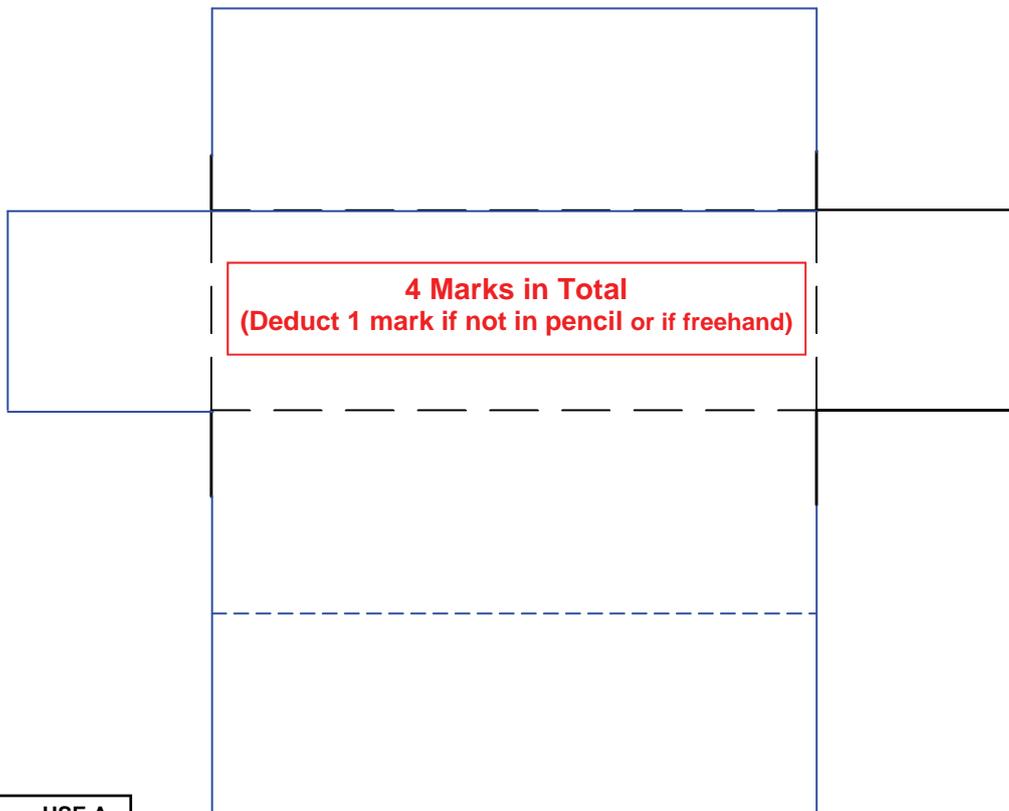
Elevation



Plan

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

(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.



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



Section 2

(135 Marks)

Answer ANY THREE questions from this section.

1. Construction

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

Name: _____ **3 Marks**

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

1. _____ **1 Mark**

2. _____ **1 Mark**

3. _____ **1 Mark**

4. _____ **1 Mark**

5. _____ **1 Mark**



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

7 Marks in Total (4 + 3)
(Deduct 1 mark if not in pencil
or if freehand)



15

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

Name the product: _____ **7 Marks**

(2) Explain the purpose of this product.

_____ **8 Marks**



15

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

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



1. _____ **1 Mark**
2. _____ **1 Mark**
3. _____ **1 Mark**
4. _____ **1 Mark**
5. _____ **1 Mark**

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

Name	1 Mark	1 Mark	1 Mark
Location	1 Mark	1 Mark	1 Mark

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

Name **ONE** such harmful gas:

Name: _____ **2 Marks**



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

1. _____ **1 Mark**

2. _____ **1 Mark**

2. Building Services

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



Name: _____ **2 Marks**



Name: _____ **2 Marks**

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

Type: _____ **1 Mark**

Reason 1: _____ **2 Marks**

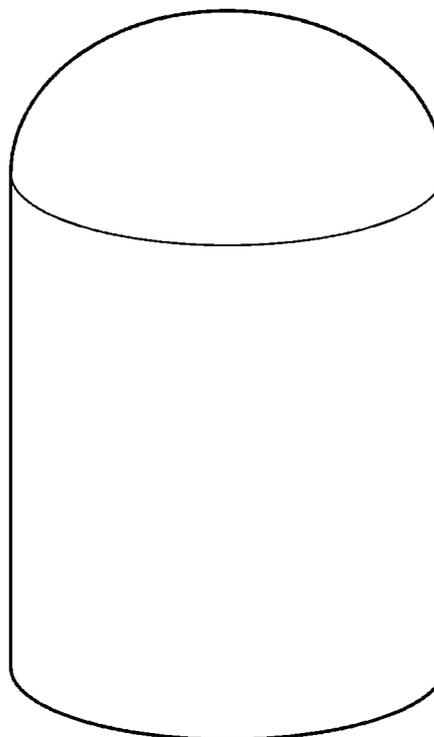
Reason 2: _____ **2 Marks**

- (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.



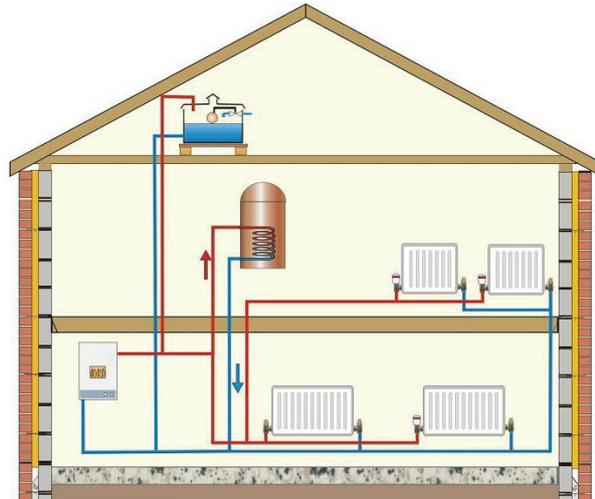
6 Marks in Total
(Deduct 1 mark if not in pencil
or if freehand)



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

Explain how the system works.

5 Marks



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

Advantage 1: _____ **3 Marks**

Advantage 2: _____ **2 Marks**

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



Advantage 1: _____ **3 Marks**

Advantage 2: _____ **2 Marks**

15

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



3 Marks



3 Marks



3 Marks

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

6 Marks

15

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 .



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



2 Marks

- (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: _____ **2 Marks**

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

1. _____ **1 Mark**

2. _____ **1 Mark**

3. _____ **1 Mark**

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



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

Name: _____ **1 Mark**

Use: _____ **1 Mark**



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



4 Marks

4 Marks



4 Marks



4 Marks



16

(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.



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



14

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. **3 Marks** _____



2. **3 Marks** _____



3. **3 Marks** _____

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

Name: **1 Mark** _____

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

Disadvantage 1: **1 Mark** _____

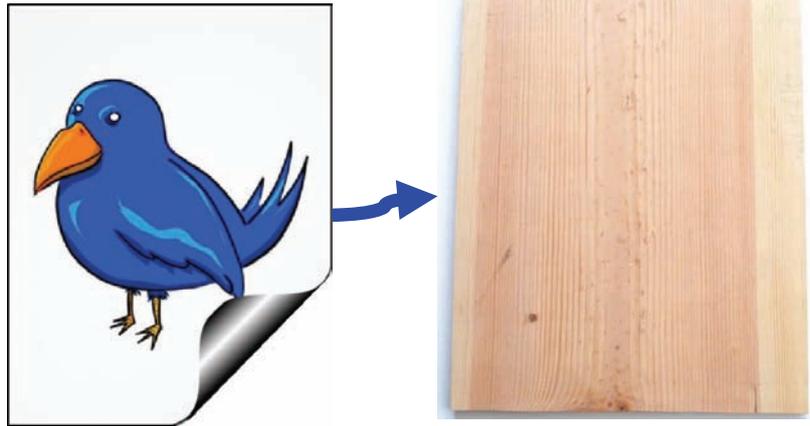
Disadvantage 2: **1 Mark** _____

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

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



- (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.



7 Marks

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



15

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

1. _____ **3 Marks**

2. _____ **3 Marks**

3. _____ **3 Marks**

- (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 Marks**

2. _____ **2 Marks**

3. _____ **2 Marks**

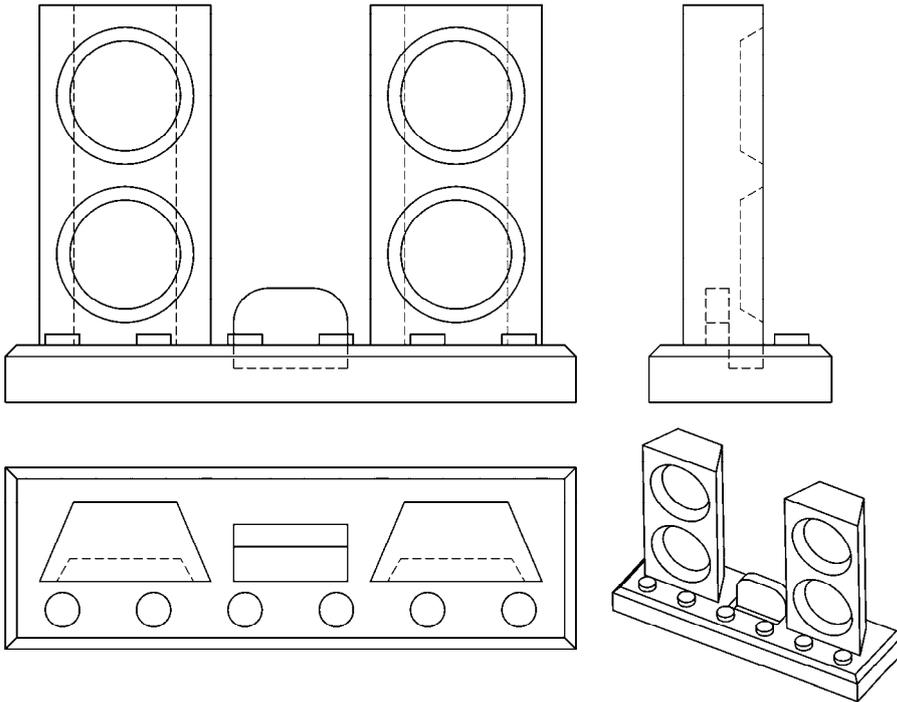
15

5. Computer Aided Design

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

Package: _____ **2 Marks**

- (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	1 Mark _____	2 Marks _____ _____
2	1 Mark _____	2 Marks _____ _____
3	1 Mark _____	2 Marks _____ _____
4	1 Mark _____	2 Marks _____ _____
5	1 Mark _____	2 Marks _____ _____

(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**.



8 Marks

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

Advantage 1: _____ **3 Marks**

Advantage 2: _____ **3 Marks**

14

(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: _____ **2 Marks**

Offsite Backup means: _____ **2 Marks**

(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
Onsite	2 Marks	2 Marks	1 Mark
	_____	_____	_____
	_____	_____	_____
Offsite	2 Marks	2 Marks	1 Mark
	_____	_____	_____
	_____	_____	_____

14

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