

**EXAM FEVER**

# Technology 7 Workbook

**- ANSWERS -**

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# 1 What is Technology?

## Question 1

- 1.1 Technology is the process of using natural and synthetic materials to make a new that will solve a problem. (2)
- 1.2 A person trained in the designing and making of different products. (2)

## Question 2

- a) Knowledge: Information needed to complete a task or project. (2)
- b) Skills: Abilities learnt that help you complete a specific task. (2)
- c) Materials: Substances that objects are made from. (2)
- d) Values: Standards of behaviour that are important in life. (2)

## Question 3

Investigate, describing, developing and evaluating. (4)

# 2 The Design Process

## Question 1

- Investigate
- Design
- Make
- Evaluate
- Communicate (6)

## Question 2

- Who is the product made for?
- What will it look like?
- What is its purpose?
- What materials are to be used?
- Is the product safe to use?
- Has the product taken into account the values of the user? (6)

## Question 3

- Who is it for?
- What is it for?
- Will it be able to do the job?
- Is it cost effective?
- Is it safe?
- Is it easy to use?
- Does it look good?
- Will it affect society?
- Will it affect the environment? (9)

## Question 4

- 4.1 • I have been asked by an electronics company called “Music Forever” to design a new set of headphones for their winter campaign.
- They will be used to launch a new warm range of headphones which customers can use to keep their ears warm while listening to music. (4)

- 4.2 • Must be adjustable.  
 • The ear pieces must be 10 cm wide.  
 • They must be either black or grey.
- 4.3 • Must not cost more than R1 000.  
 • They must fold up to fit into a handbag.  
 • Must be light.

Criteria	Mark out of 3		
Is adjustable.	1	2	3
Is light.	1	2	3
Does not cost more than R1 000.	1	2	3
The ear pieces are 10 cm wide.	1	2	3
The ear pieces are either black or grey.	1	2	3
They fold up to fit into a handbag.	1	2	3

- 6 Marks for including all aspects of the headphones.
- 2 Mark for a neat layout.
- 2 Marks for a logical marking scheme.

### Question 5





- 5.1 My school has asked me to design the style of a new shirt to be worn by all learners. (4)
- 5.2 There must be a pocket. (3)  
 Must be a bright colour.  
 The pocket must be 10 cm deep and 7 cm wide.
- 5.3 The school badge may appear on the front or the back. (3)  
 Must be made out of a recyclable material.  
 Must be long enough to be tucked in.

Criteria	Mark out of 3		
There is a pocket.	1	2	3
It is a bright colour.	1	2	3
The pocket is 10 cm deep and 7 cm wide.	1	2	3
The school badge is on either the front or the back.	1	2	3
It is made out of a recyclable material.	1	2	3
It is long enough to be tucked in.	1	2	3

- 6 Marks for including all aspects of the headphones.
- 2 Mark for a neat layout.
- 2 Marks for a logical marking scheme.

# 3 Graphic Communication

## Question 2

Line Type	Description	Use
	<ul style="list-style-type: none"> <li>• Black in colour (dark).</li> <li>• Continuous.</li> </ul>	<ul style="list-style-type: none"> <li>• They are used for completed drawings.</li> <li>• They indicate the edges of objects.</li> </ul>
	<ul style="list-style-type: none"> <li>• Feint (light) lines.</li> <li>• Grey in colour.</li> <li>• Continuous.</li> </ul>	<ul style="list-style-type: none"> <li>• They are used as a guide to help draw an object.</li> </ul>
	<ul style="list-style-type: none"> <li>• Dashed (broken) line.</li> </ul>	<ul style="list-style-type: none"> <li>• They are used to show hidden detail.</li> </ul>
	<ul style="list-style-type: none"> <li>• Thin.</li> <li>• Black in colour (dark).</li> <li>• Arrow heads (narrow).</li> <li>• Measurement written.</li> </ul>	<ul style="list-style-type: none"> <li>• Used to show the start and end of a dimension.</li> </ul>
1 : 5	<ul style="list-style-type: none"> <li>• Two numbers.</li> <li>• Separated by a colon.</li> </ul>	<ul style="list-style-type: none"> <li>• To show what size a drawing is drawn at compared to the original object.</li> </ul>

### Question 3

3.1 Three faint lines 100 mm long.

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3.2 Three dark lines 120 mm long.

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3.3 Three dashed lines 130 mm long.

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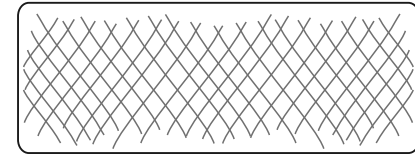
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### Question 4

### Question 5

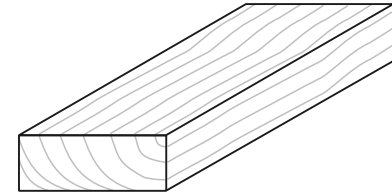
5.1 Cross-hatching



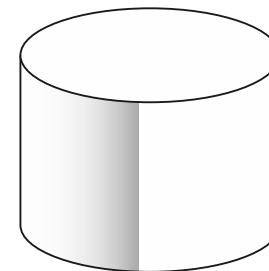
5.2 Shadows showing a shiny plastic surface.



5.3 Woodgrain



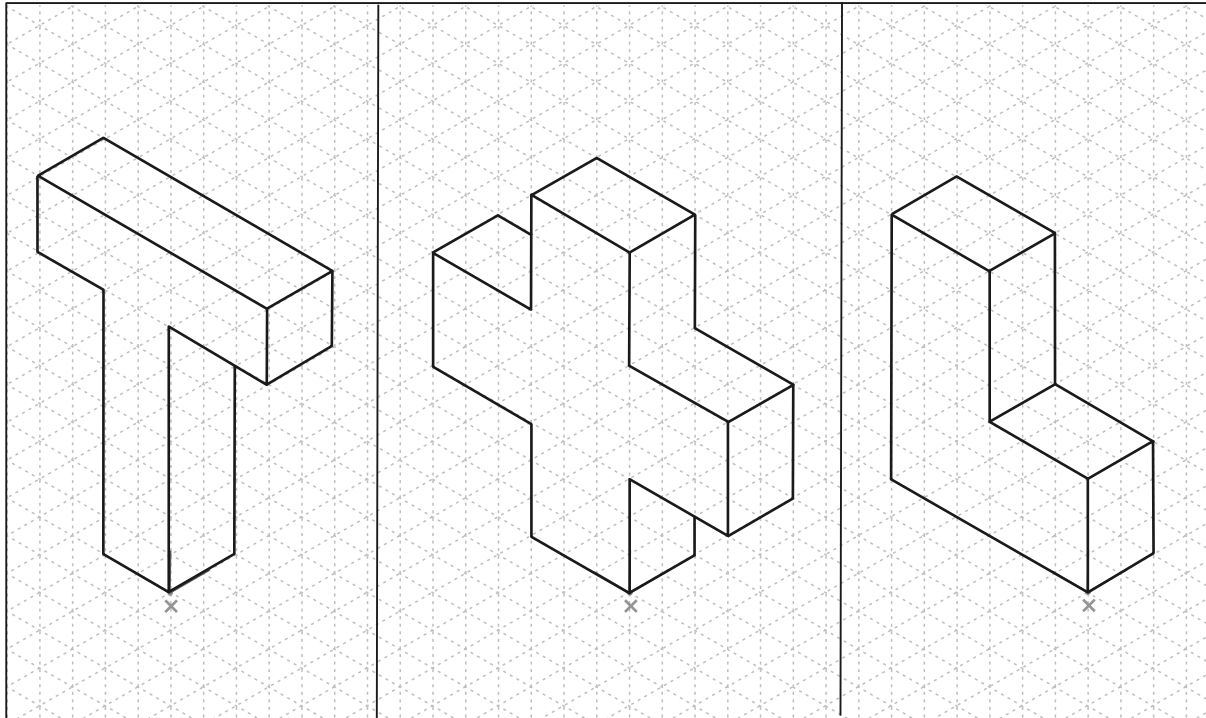
5.4 Curved lines to emphasise roundness.

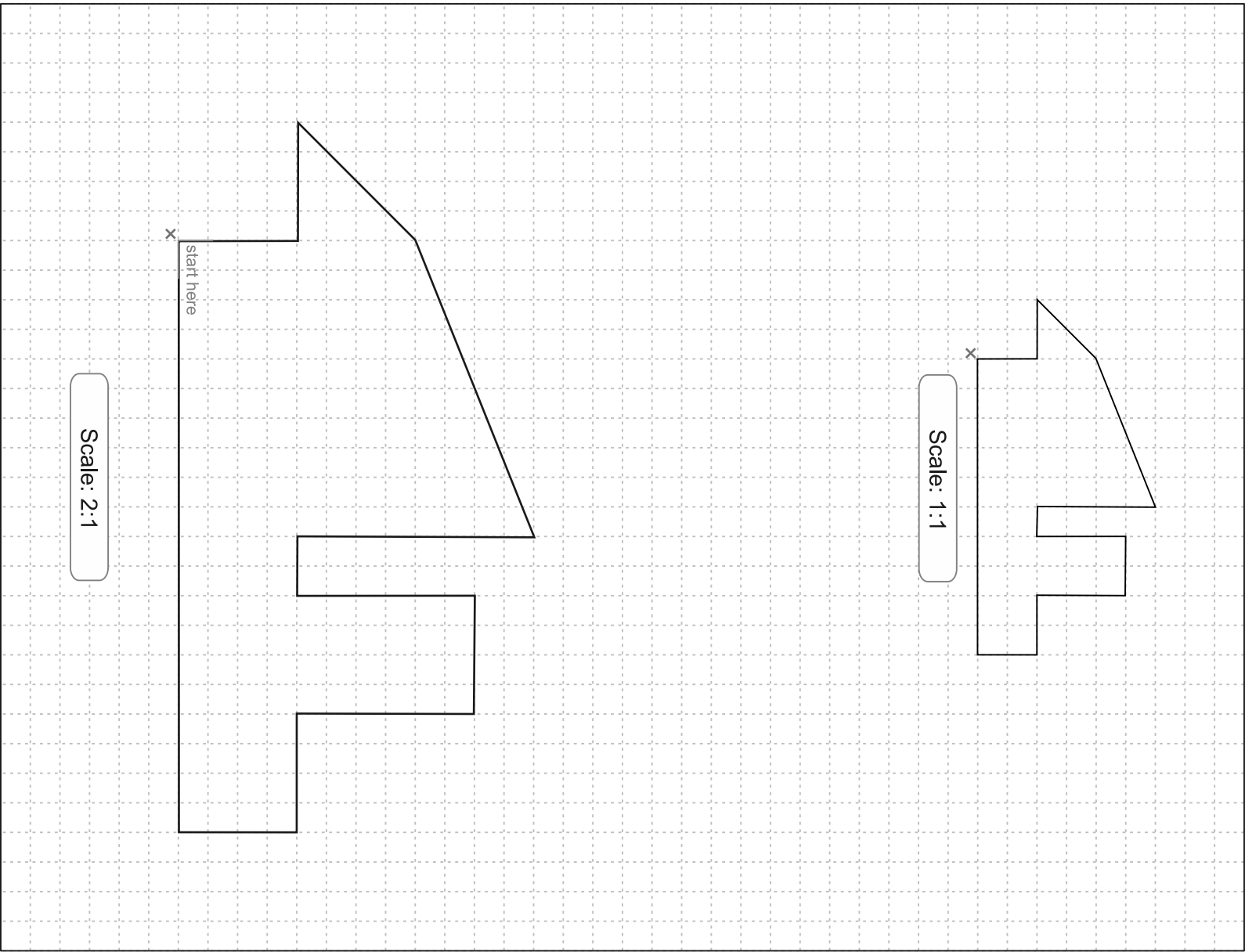


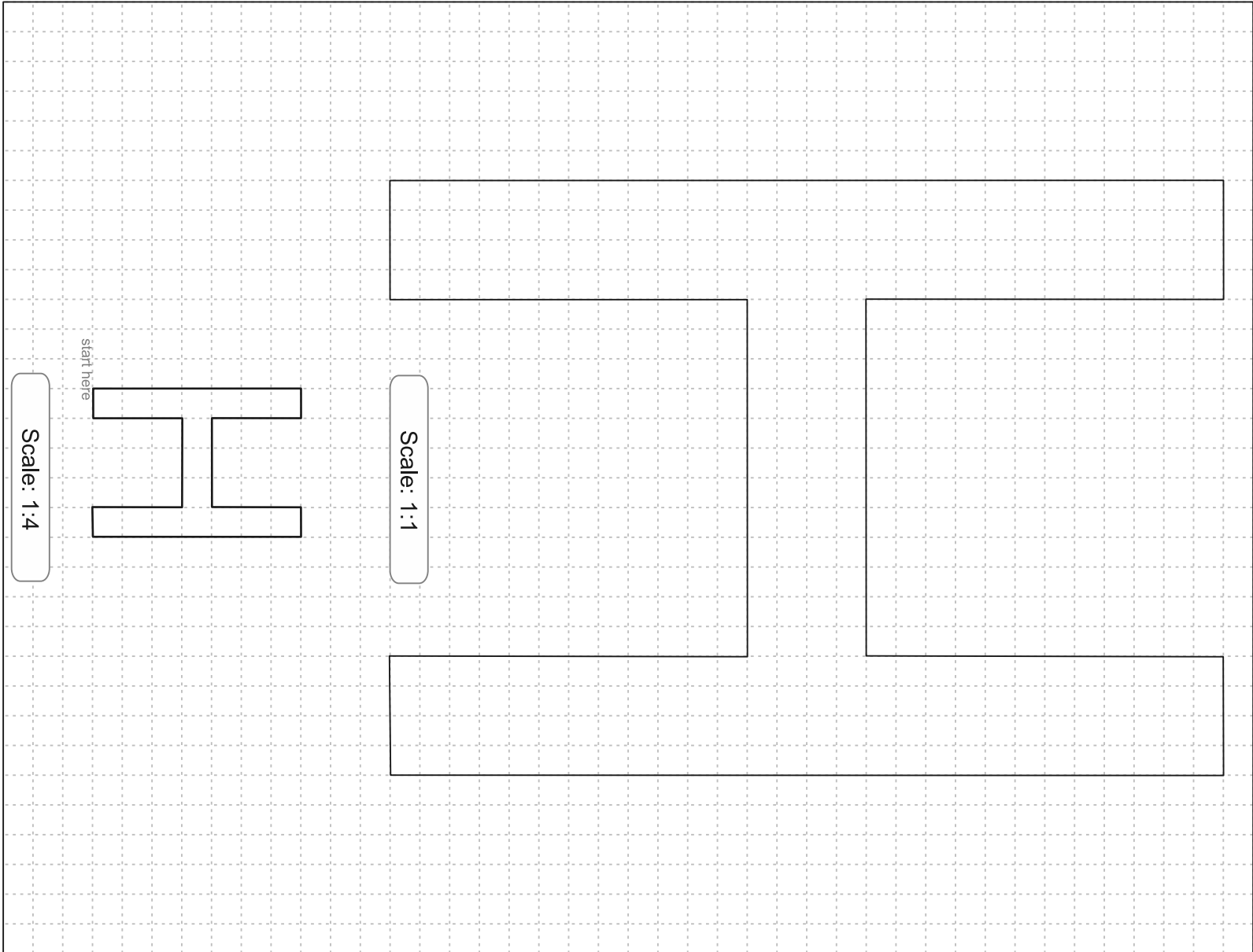
**Question 6**

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**Question 7**

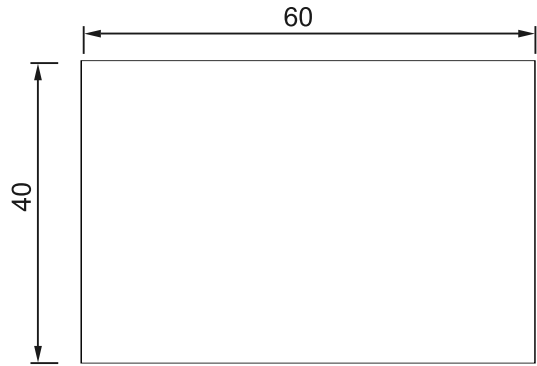




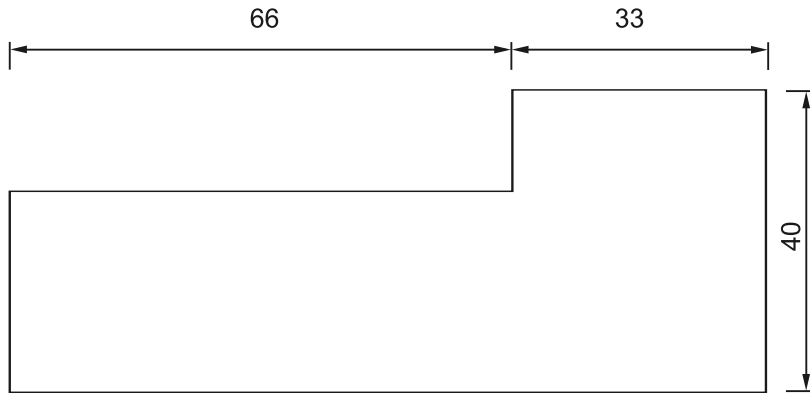


**Question 9**

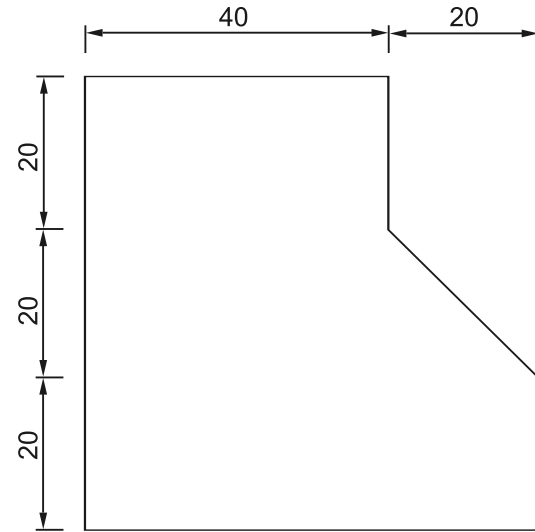
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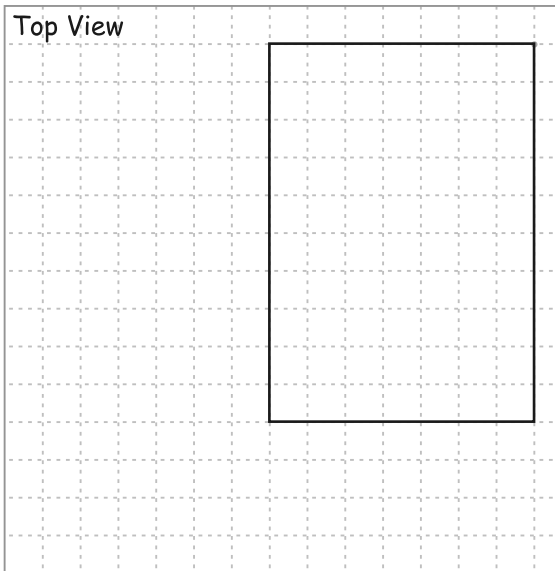
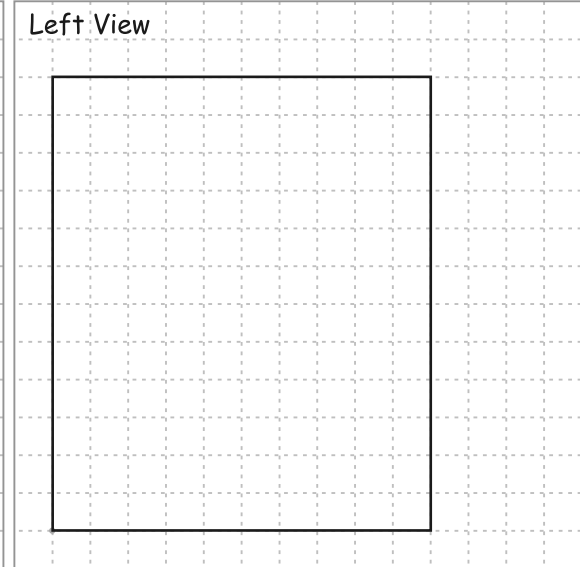
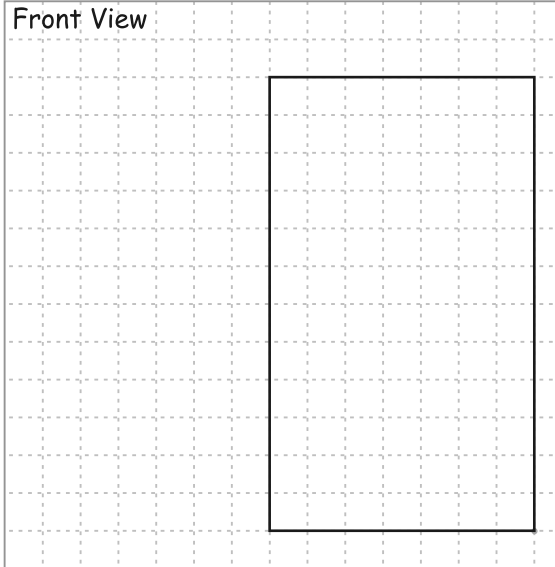
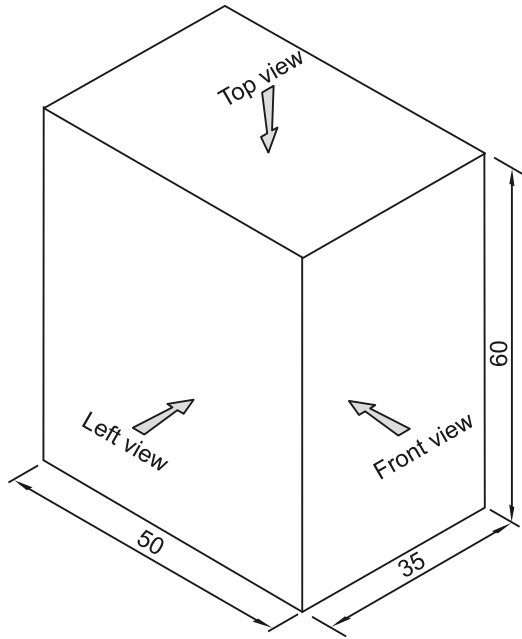
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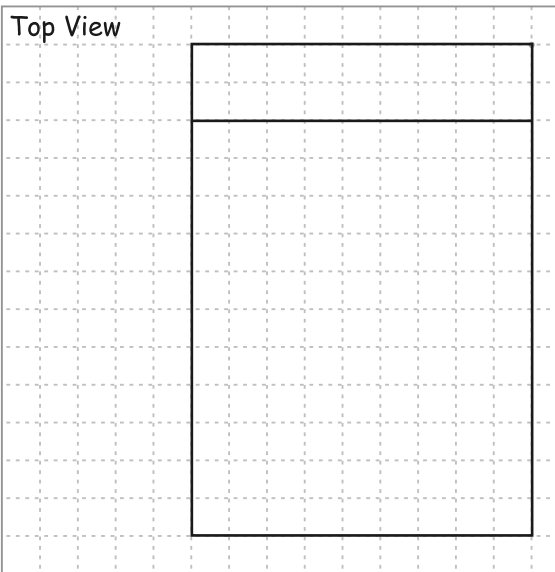
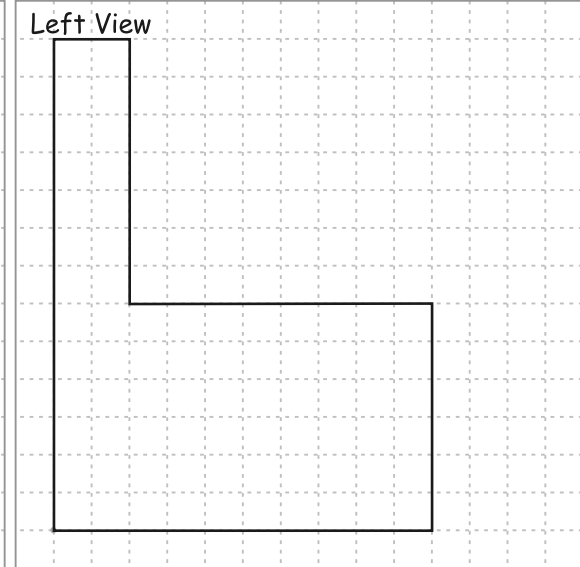
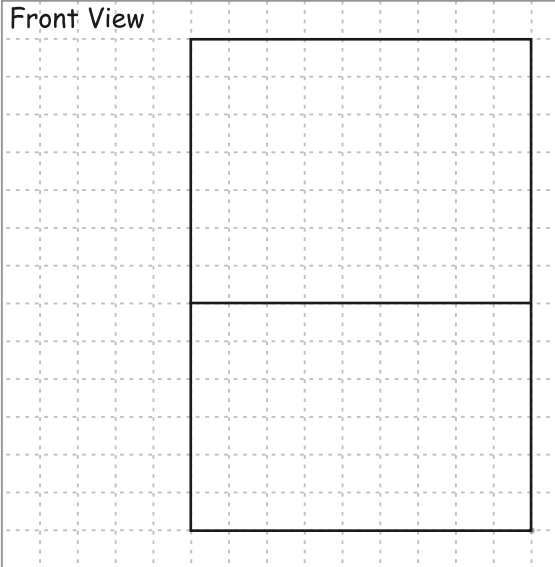
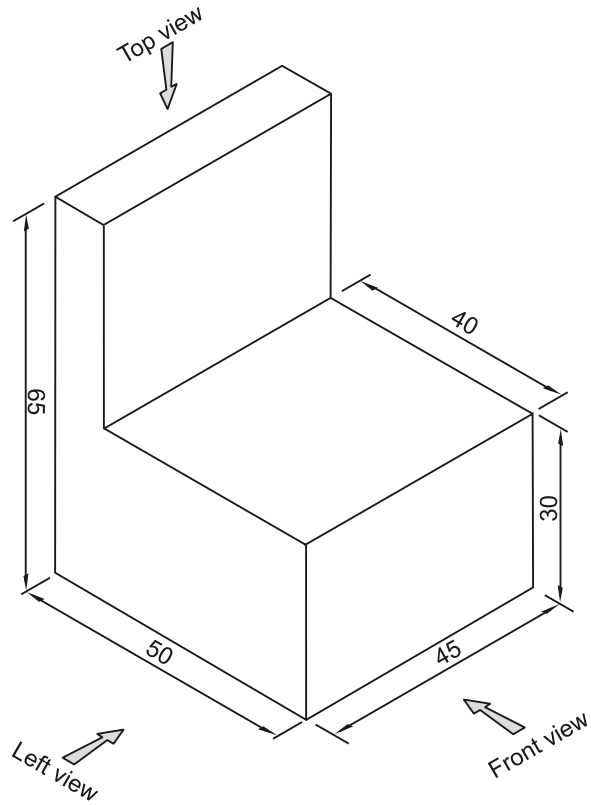
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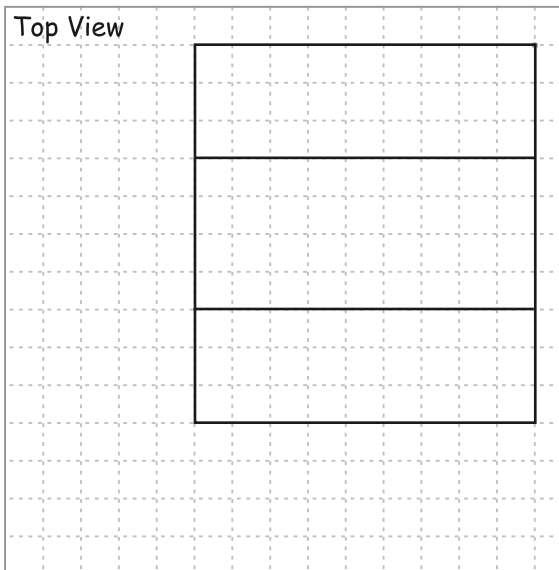
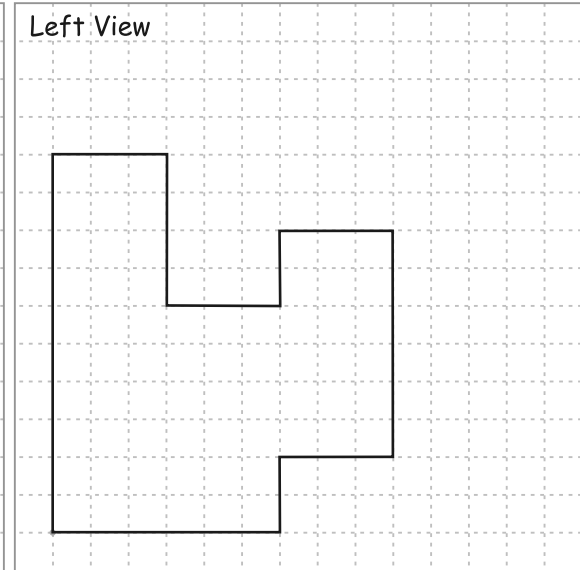
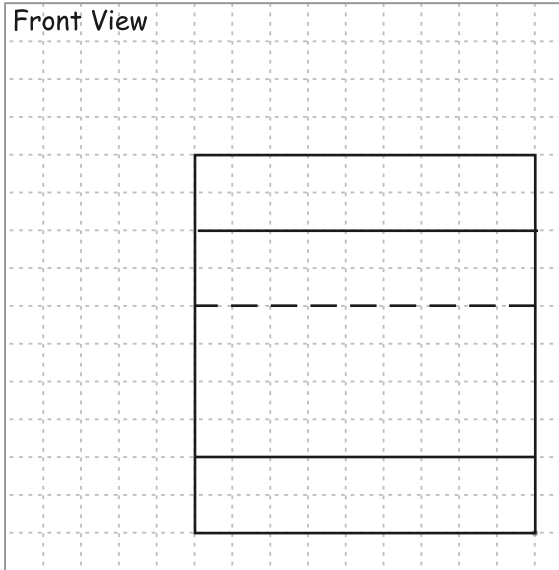
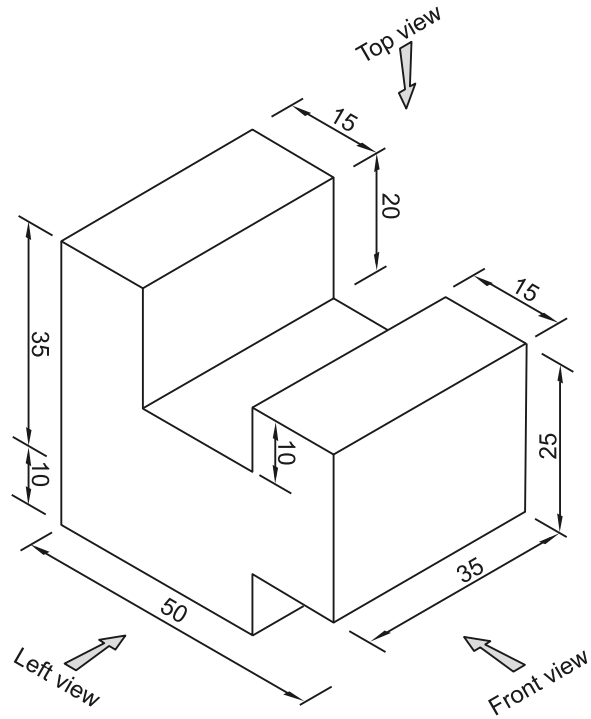
Question 10



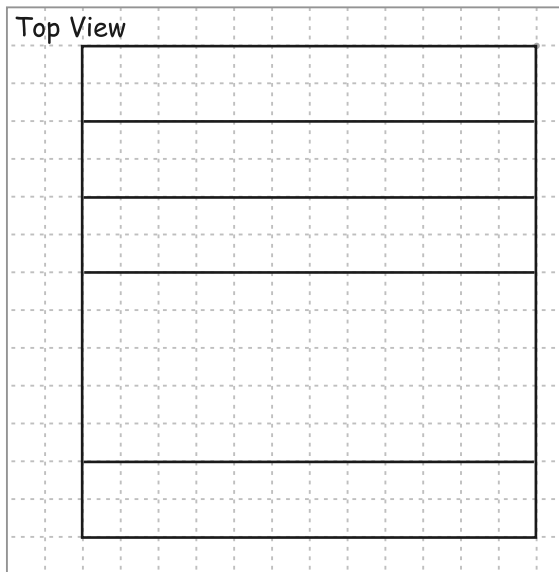
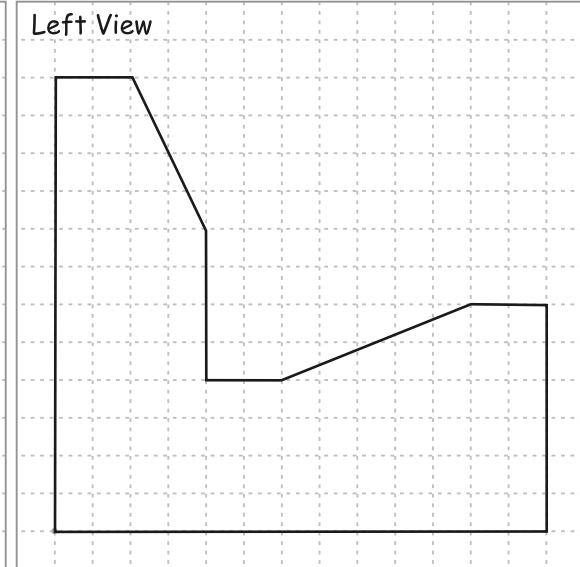
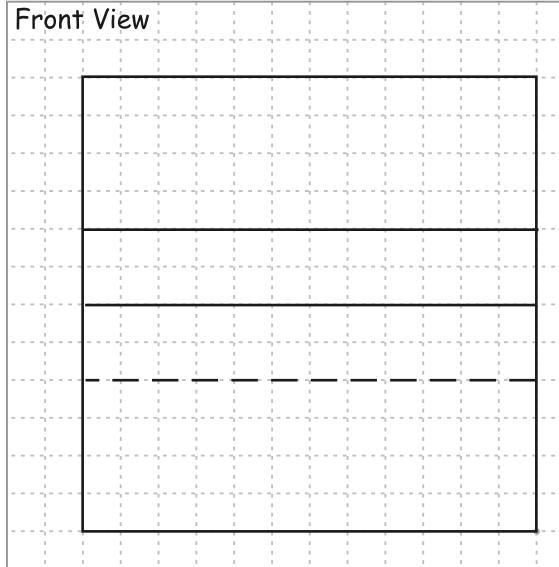
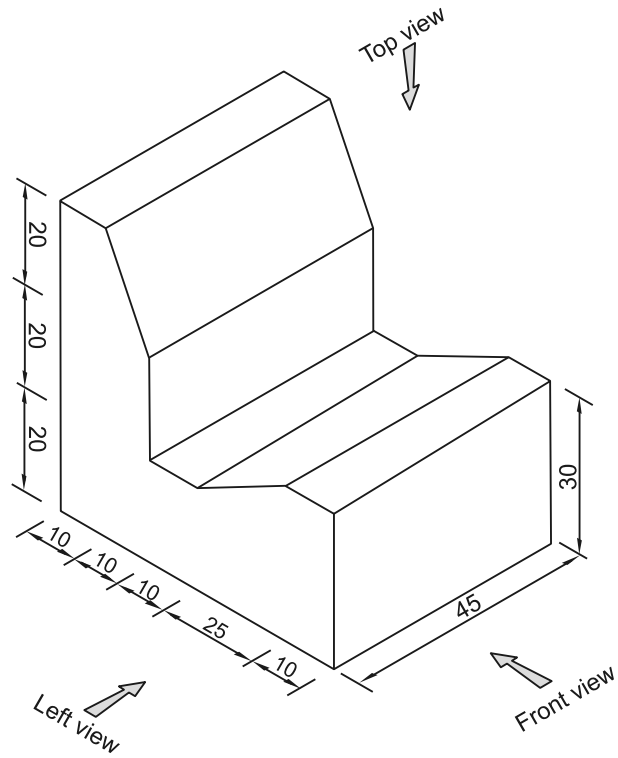
Marks		
Front view	4	
Top view	4	
Left view	4	
Total	12	



Marks		
Front view	5	
Top view	5	
Left view	6	
Total	16	



Marks		
Front view	7	
Top view	6	
Left view	10	
Total	23	



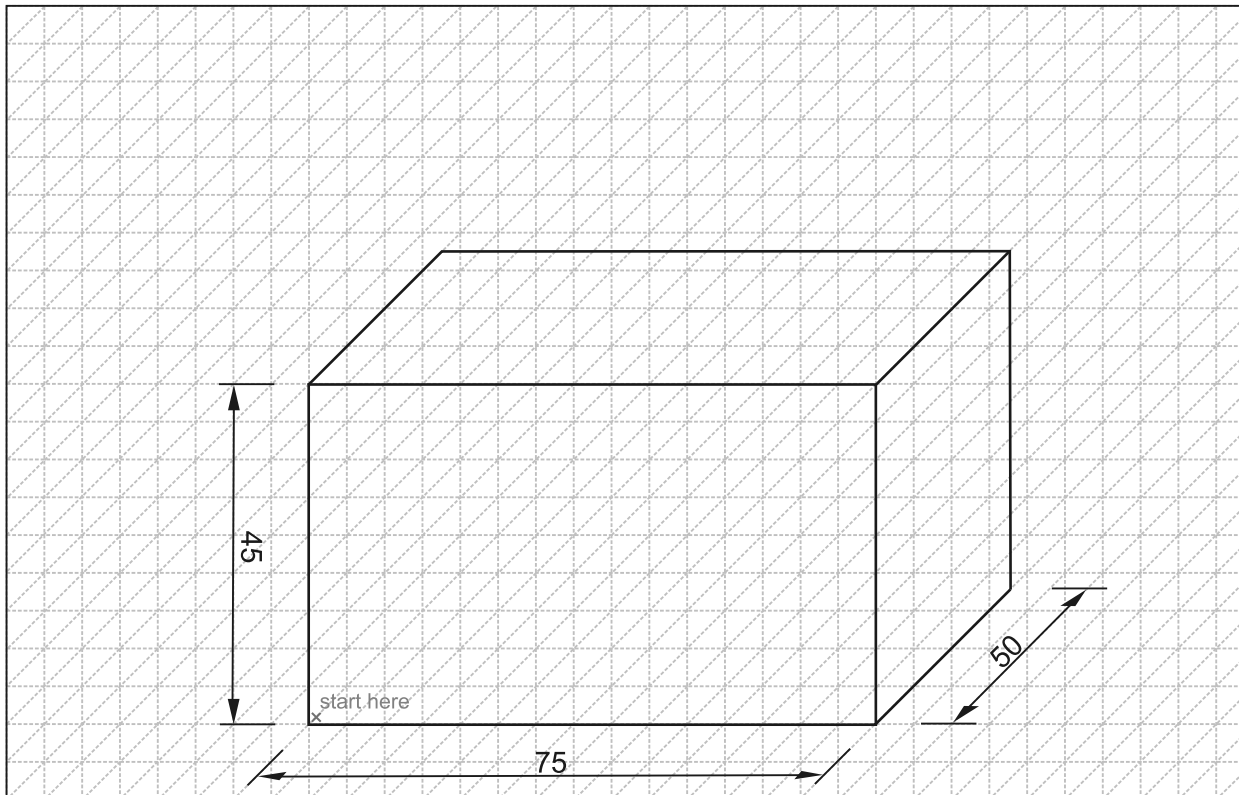
Marks		
Front view	7	
Top view	8	
Left view	9	
Total	24	

Q 11

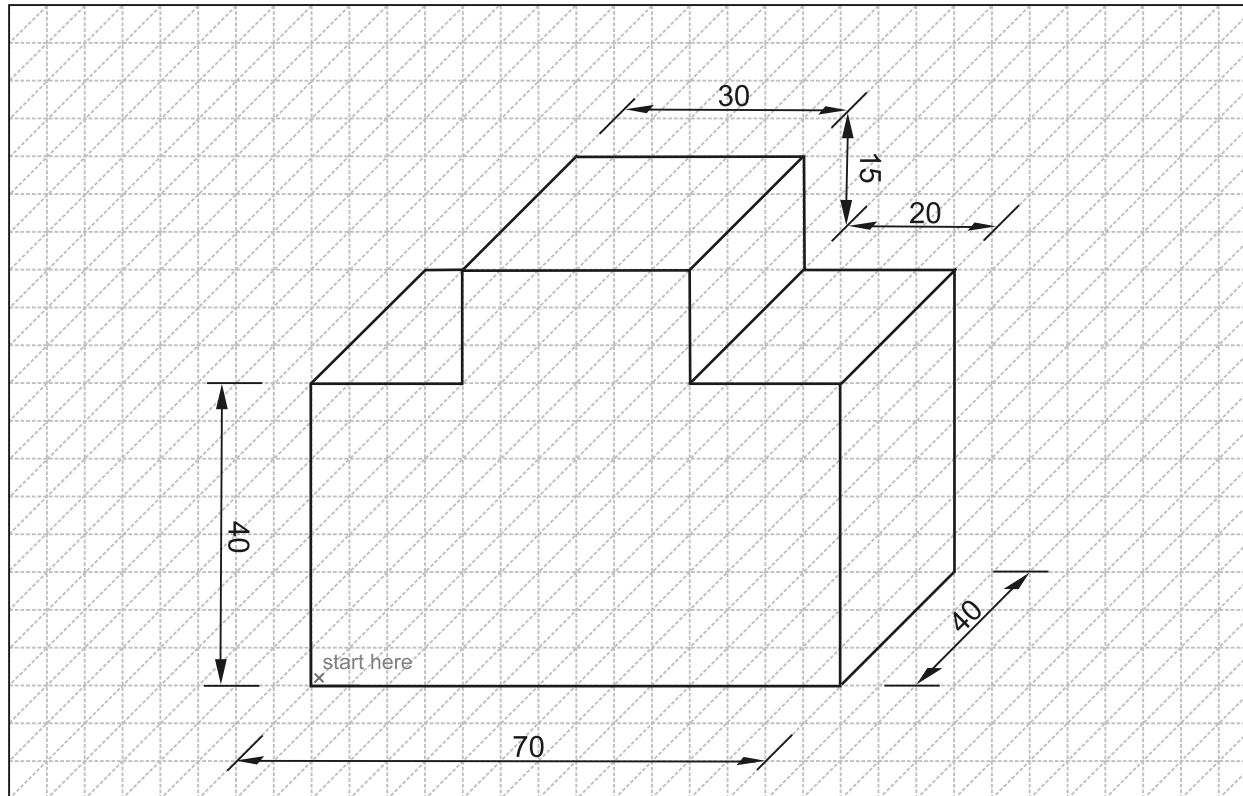
<p>Front View</p> <p style="text-align: right;">Left View</p>	<p>11.1 Use <u>one word</u> to describe the shape of the right view. (2)</p> <p style="text-align: center;">..... Square</p> <table border="1" style="margin-left: auto; margin-right: auto; border-collapse: collapse; text-align: center;"> <thead> <tr style="background-color: #e0e0e0;"> <th colspan="3">Marks</th> </tr> </thead> <tbody> <tr> <td style="padding: 2px 5px;">Front view</td> <td style="padding: 2px 5px;">8</td> <td style="width: 20px;"></td> </tr> <tr> <td style="padding: 2px 5px;">Top view</td> <td style="padding: 2px 5px;">6</td> <td></td> </tr> <tr> <td style="padding: 2px 5px;">Left view</td> <td style="padding: 2px 5px;">6</td> <td></td> </tr> <tr> <td style="padding: 2px 5px;">Dimensions</td> <td style="padding: 2px 5px;">4</td> <td></td> </tr> <tr> <td style="padding: 2px 5px;">Total</td> <td style="padding: 2px 5px;">24</td> <td></td> </tr> </tbody> </table>	Marks			Front view	8		Top view	6		Left view	6		Dimensions	4		Total	24	
Marks																			
Front view	8																		
Top view	6																		
Left view	6																		
Dimensions	4																		
Total	24																		
<p>Top View</p>																			

**Question 12**

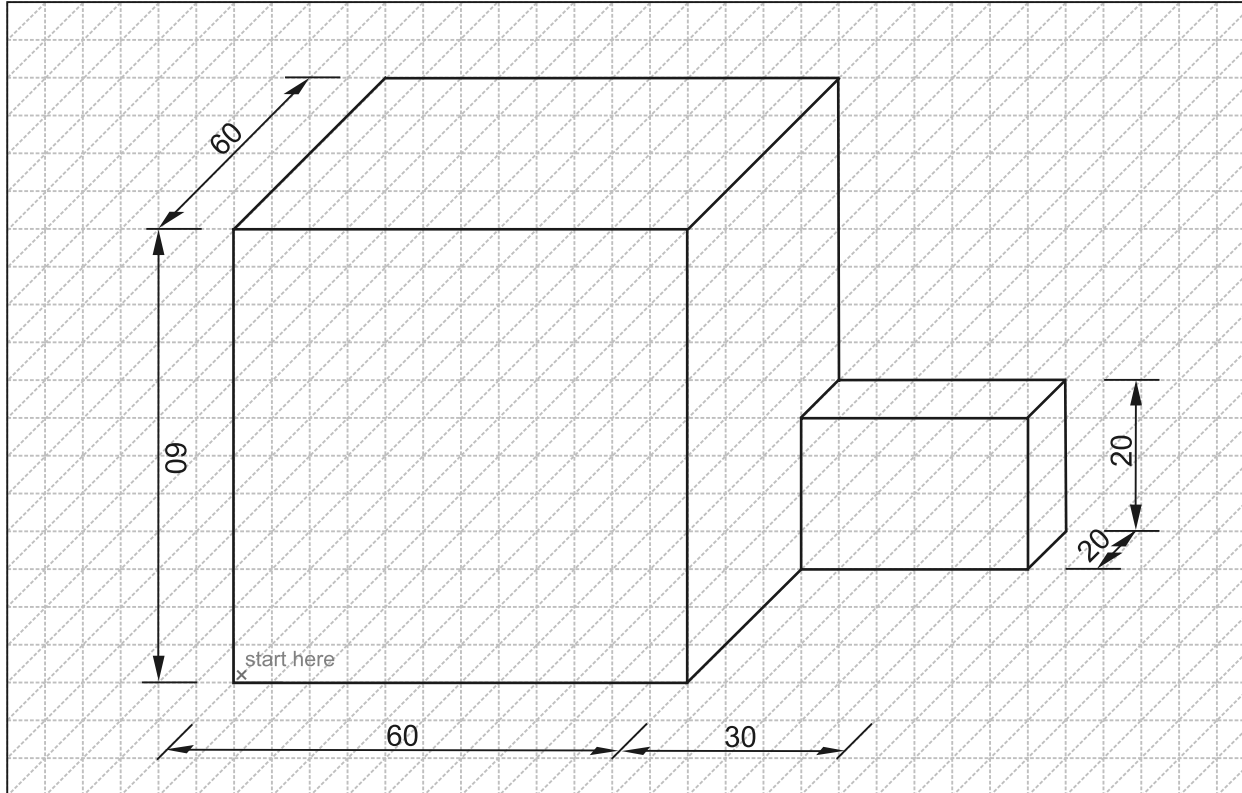
12.1



Marks		
Lines	9	
Dimensions	3	
Total	12	

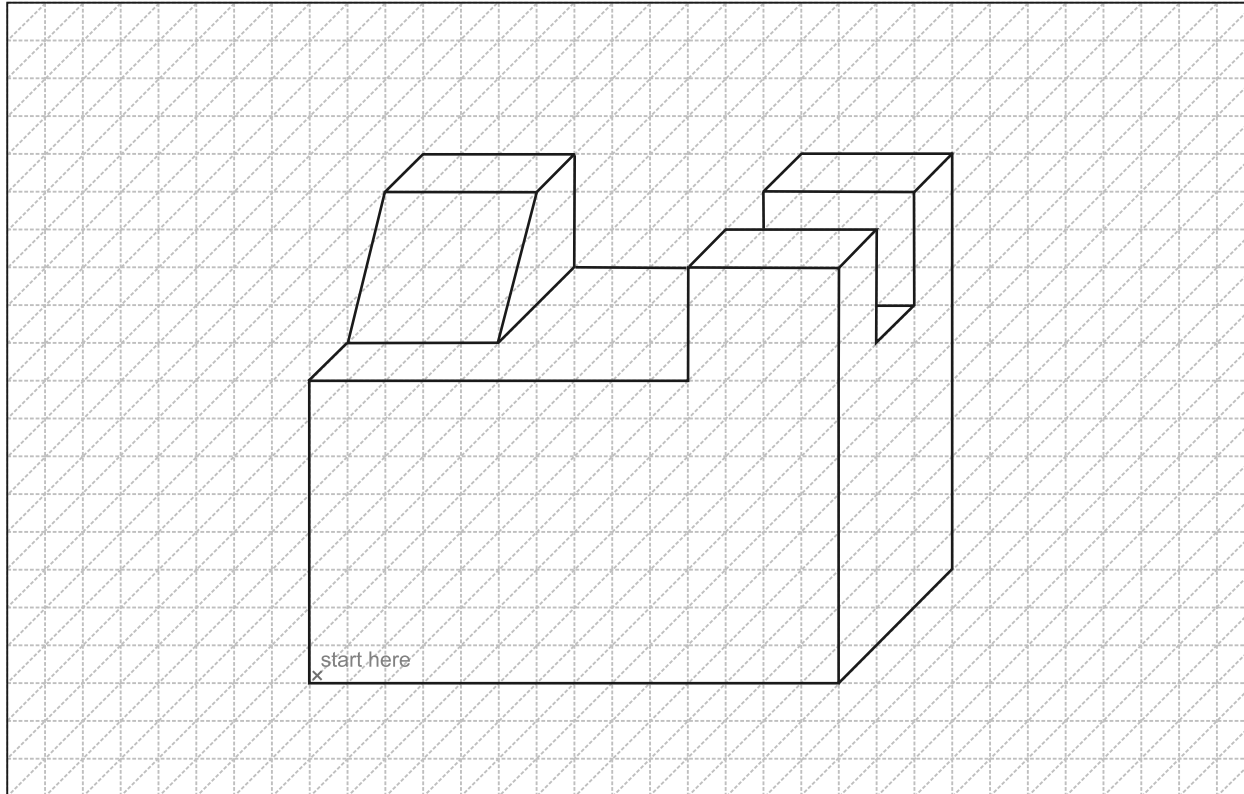


Marks		
Lines	19	
Dimensions	5	
Total	24	



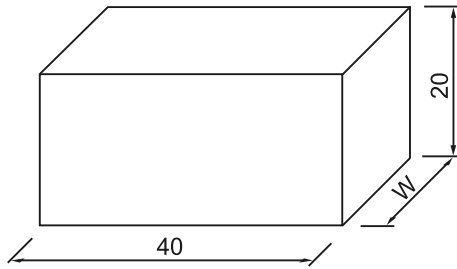
Marks		
Lines	9	
Dimensions	3	
Total	12	

12.4 (Challenge)

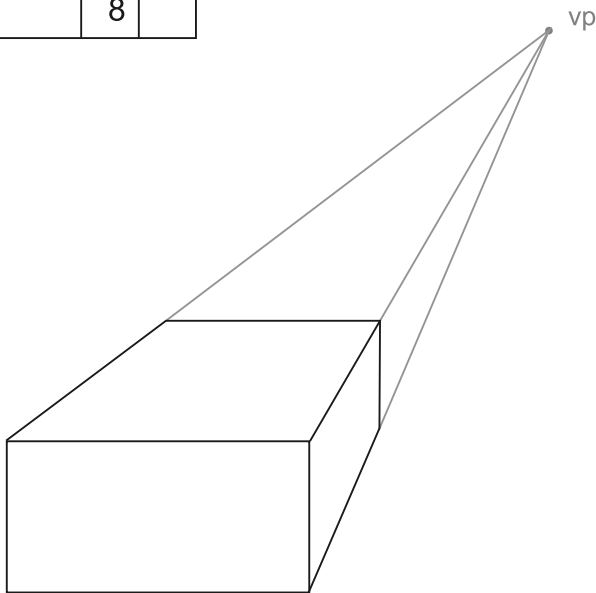


**Question 13: Perspective Drawing**

13.1

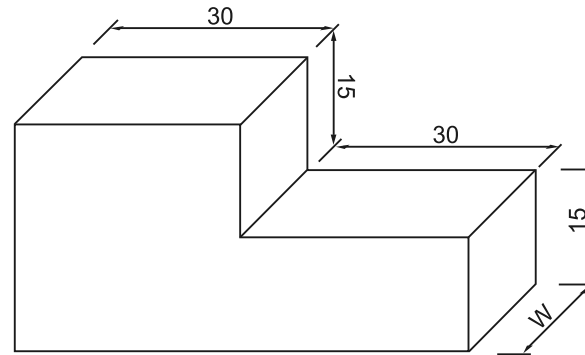


Marks		
Lines	5	
Construction	3	
Total	8	

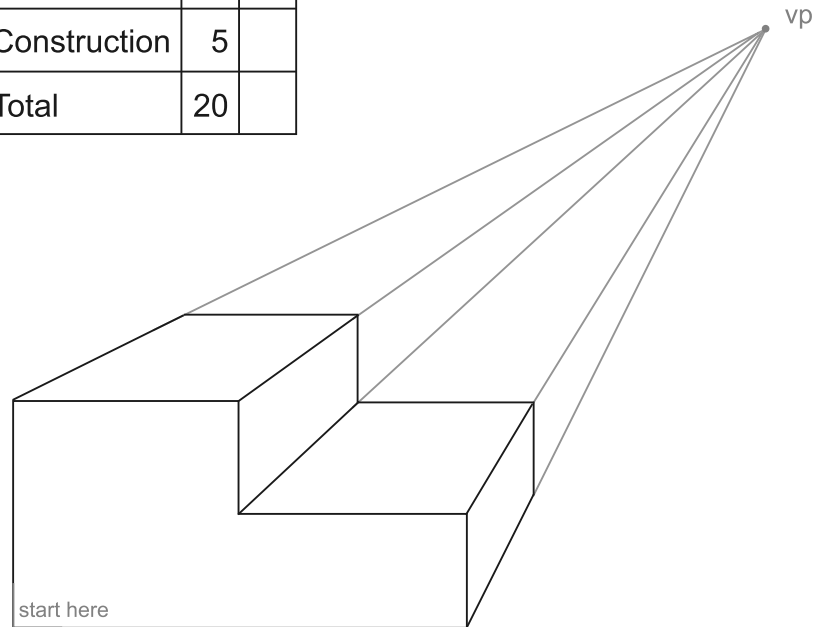


**18**

13.2



Marks		
Lines	15	
Construction	5	
Total	20	



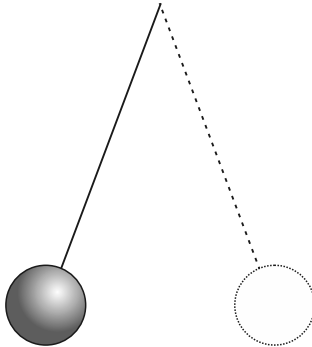
# 4 Mechanical Systems and Control

## Question 1

- 1.1 Machine: A device that can transfer force from one part to another or convert one type of movement into another. (2)
- 1.2 Linear motion: Straight line motion in one direction. (2)
- 1.3 Rotary motion: Circular motion around a centre point. (2)

## Question 2

- 2.1 Input, process, output. (3)
- 2.2

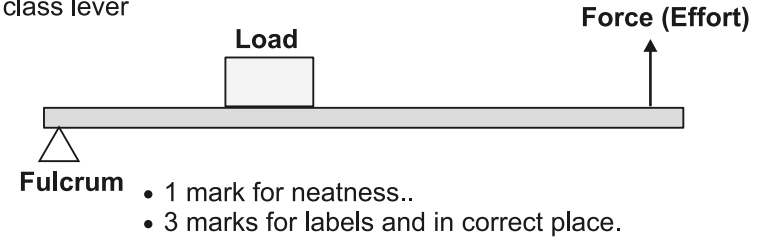


## LEVERS

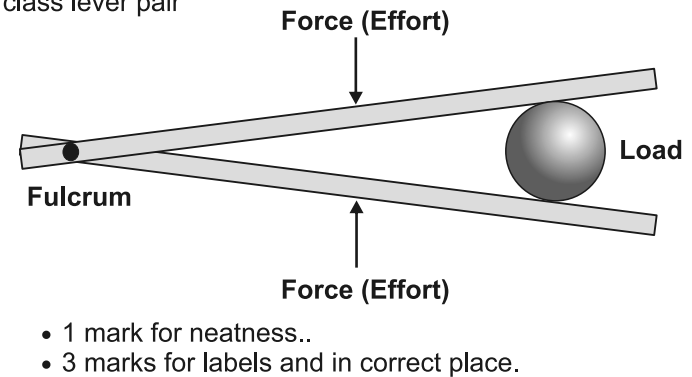
### Question 1

- 1.1 A: Fulcrum  
 B: Load  
 C: Effort  
 D: Load arm  
 E: Effort arm

### 1.2 a) 2nd class lever



### 1.2 b) 3rd class lever pair

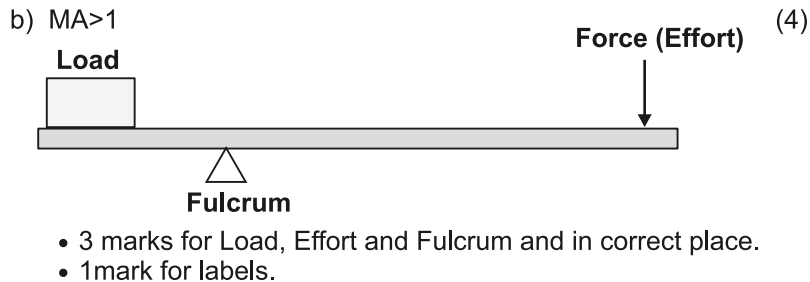
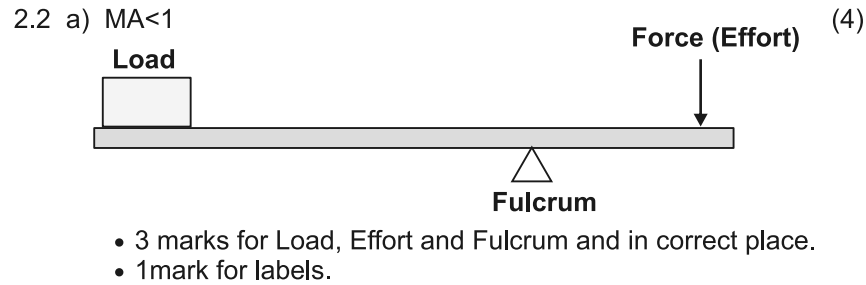


### 1.3 First class lever      Second class lever      Third class lever

- |            |               |               |
|------------|---------------|---------------|
| • Scissors | • Wheelbarrow | • Tweezers    |
| • Pliers   | • Nut Cracker | • Braai Tongs |
| • Seesaw   | • Paper Punch | • Shears      |

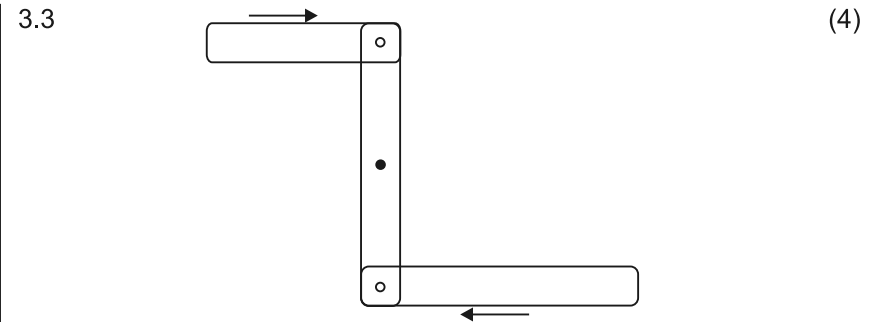
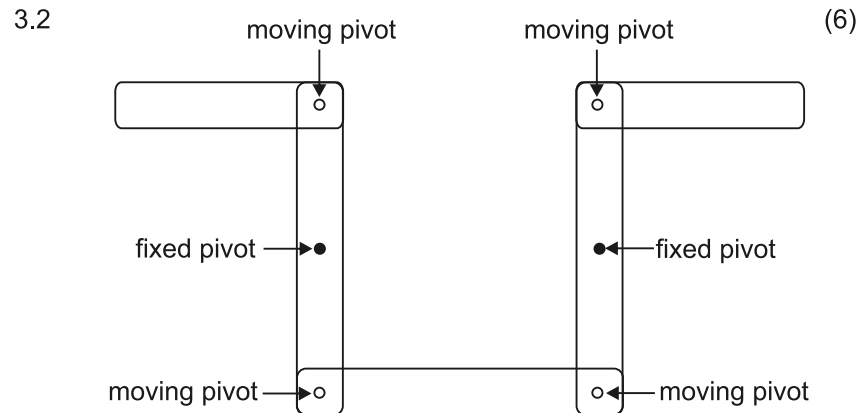
### Question 2

- 2.1 a) It is an indication of the difference between the load and the effort needed to lift it.
- b) Two levers attached together on a common fulcrum to work together. (4×2)



### Question 3

3.1 It is a mechanism made up of a number of rigid members that allow the transfer of motion. (3)

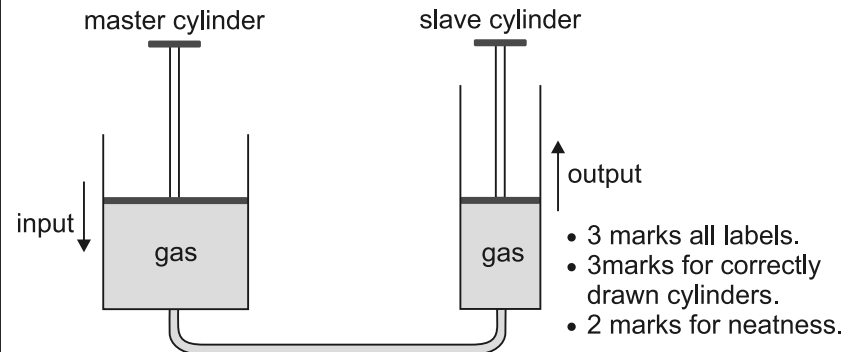


## PNEUMATICS AND HYDRAULICS

### Question 1

- Pneumatics use a compressed gas to transfer a force from one part of a system to another to create an output force. (4)
- Hydraulics do the same except by using liquid instead of gas.

### Question 2



### Question 3

*Pneumatic systems (2)*  
 Jack Hammer  
 Air brakes

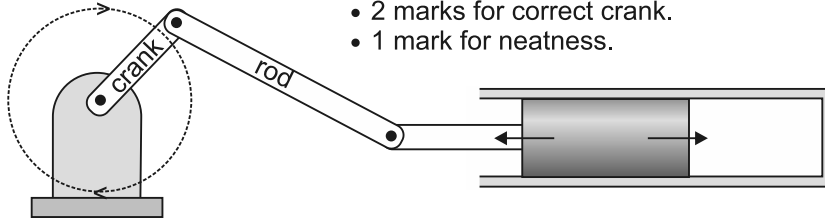
*Hydraulic systems (2)*  
 Hydraulic jack  
 Jaws of life

## THE CRANK

### Question 1

A crank has one arm moving in a circle connected at a right angle to another circular arm of a smaller radius. (2)

### Question 2



- 1 mark for arrows showing movement.
- 2 marks for correct crank.
- 1 mark for neatness.

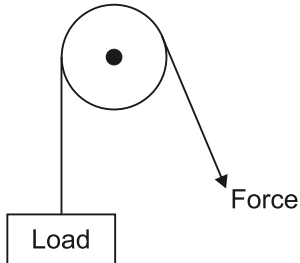
## THE PULLEY

### Question 1

A pulley is a wheel with a groove, through which a rope or cable can pass. (2)

### Question 2

2.1



- 2 marks for correct drawing.
- 1 mark for labels.

2.2 This system allows us to use our own weight to help us pull down to lift the weight up. (2)

2.2 A pulley system on a crane. (2)  
A block-and-tackle.

## 5 Structures

### Question 1

1.1 To support, to cover a distance and to cover and protect. (3)

1.2 Man-made; Natural; Man-made (3)

1.3 a) *Shell*: Hollow. (3 × 3)

*Function*: Contains and protects.

b) *Solid mass*: Made of solid dense material.

*Function*: Used for its heavy weight.

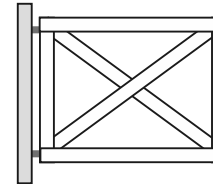
c) *Frame*: Made up of individual members.

*Function*: Provides support.

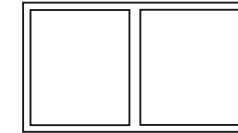
1.4 a) helmet, house (2)

b) hammer, brick (2)

1.5



Gate



Window frame

(2 × 2)

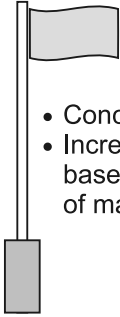
### Question 2

2.1 a) skyscraper (1)

b) pylon (1)

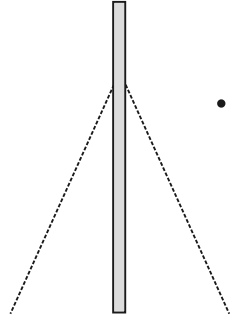
c) concrete bridge (1)

2.2



Flag pole

- Concrete block at base.
- Increase size of the base and lowers center of mass/gravity.



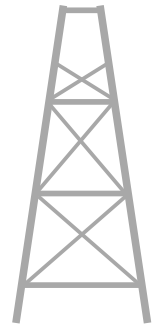
Pole

- Add stay wires to maintain upright position.

(3 × 2)

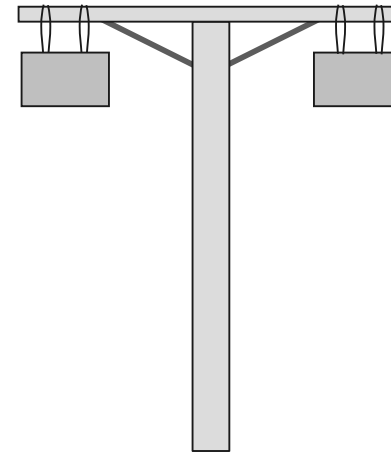
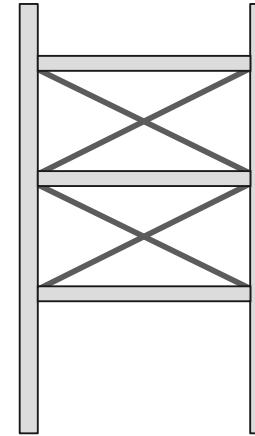
3.2

(2 × 2)



Electrical pylon

- Increase size of the base.



**Question 3**

3.1 (Any two)

- Reinforcing
- Use hollow tubes
- Corrugations
- Use a beam on its edge
- Use angle members
- Use anchors

(2)

## 6 Magnetism

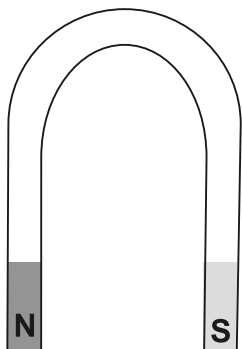
### Question 1

(2 × 5)

- a) Magnetism is the ability of a material to exert a force on certain materials.
- b) A magnetic field is the region around a magnet where a magnetic force can be felt.
- c) Permanent magnets keep their magnetism for a very long time.
- d) Temporary magnets act like permanent magnets only for a short amount of time.
- e) An electromagnet is made by passing an electric current through a coil of wire.

### Question 2

a)



Horseshoe magnet

b)



Bar magnet

## 7 Electrical Systems & Control

### Question 1

(2 × 7)

- a) Electrical systems are items such as electrical appliances and gadgets used in society today.
- b) Current is the flow of electricity along a conductor.
- c) Voltage is the energy of electricity.
- d) A cell is able to produce a current which carries energy using chemicals.
- e) A conductor is a substance that allows current to pass through it.
- f) A switch is a device that can allow or stop a current.
- g) A circuit diagram is a diagram of the path taken by an electric current.

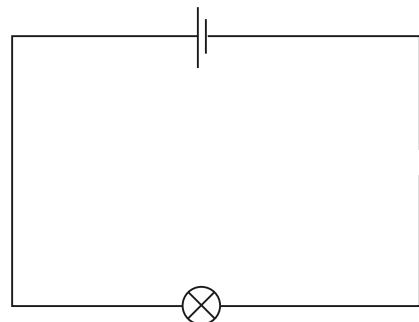
### Question 2

(2)

- Electrical energy converted into kinetic/wind energy.
- Electrical energy converted into heat energy.

### Question 3

(4)



- 3 marks for correct symbols in correct places.
- 1 mark for neatness.

# 8 Processing: Emergency Situations & Technology

## REFUGEES

### Question 1

A refugee is a person who flees from their home country and travels to another country due to a fear for their own safety. (2)

### Question 2

2.1 Any 4 correct. (4)

- War or violence in their own country.
- Persecution because of race, religion or political beliefs.
- Natural disasters like famine, flooding and earthquakes.
- Economic instability.

2.2 Any 4 correct. (4)

- Shelter.
- Water which is free of diseases like cholera and other contaminants.
- Nutritious food.
- Proper sanitation.
- Medical attention.
- Clothing and blankets.

2.3 Any 4 correct. (4)

- Shelter provided is usually in the form of tents, the tent can easily tear, catch alight or blown away in windy weather.
- Very little access to food, mostly dependant on organisations like the United Nations Refugee Agency and the government of the host country.
- Dirty water, which leads to diseases and death.
- Lack of proper sanitation.
- Unable to communicate due to a language barrier.
- No work permits/lack of employment.

### Question 3

3.1 The United Nations and the World Food Programme. (2)

3.2 (5)

- It must be nutritious, provide nutrients that the body needs to grow and stay healthy.
- Must not spoil easily.
- Must be able to be prepared in a limited space with limited tools.
- Must be prepared over a wood fire.
- Must be cheap and familiar to the people eating it.

3.3 Proteins, carbohydrates, dairy, grains, fruit and vegetables. (5)

3.4 (8)

- Appearance of the food.
- Texture
- Smell
- Flavour
- A meal high in vitamins and minerals.
- Food from all five food groups.
- The minimum energy requirements for an adult.
- To be cooked over an open fire.
- Conditions in a refugee camp.
- Availability of food.
- Cost of food.

3.5 Sample answer. (2 marks per subheading)

*Recipe Name:* Samp and Beans

*Equipment needed:* Big 25 l pot, big mixing spoon

*Ingredients:* 5 kg samp  
3 kg beans  
2 table Spoons salt

*Method:* Heat 15 l water  
When boiling add the samp  
After 15 min add the beans  
Take off the heat and allow to cool after  
45 min cooking.

## PROTECTIVE CLOTHING

### Question 1

- 1.1 (3 × 2)
- a) It is clothing worn by people to protect their body from harmful and dangerous risks such as fire, insects, bullets, chemicals, blood and body fluids.
  - b) These are materials or fabrics that are made by spinning and weaving.
  - c) Fibres are the raw materials which are spun into yarns.
- 1.2 Firefighting, life-saving, welding, paramedics, doctors. (3)  
(ANY 3 correct examples.)

(8)

### Question 2

- 2.1 Natural and Synthetic fibres. (2)
- 2.2 Natural: Cotton, sisal, wool, fur. (ANY two correct examples.) (2×2)  
Synthetic: Nylon, polyester
- 2.3 Adding a layer of wax. (3)  
Coating it in a soybean oil and turpentine mix.  
Coating it in a spray that has a fluoropolymer base.
- 2.4 (10)

Textile	Smell when burned	Smoke colour
Wool	Smells like burning hair or feathers	Dark Smoke
Cotton	Smells like burning paper	Grey or White
Nylon	Smells like celery	Black Smoke
Silk	Smells like burnt hair	White Smoke
Polyester	Sweet chemical smell	Black Smoke

### Question 3

- 3.1 a) Nomex Fabric (3)  
b) Leather  
c) Rubber and leather
- 3.2 a) Nomex (3)  
b) Kevlar  
c) Nomex

### Question 4

- 4.1 They are brightly coloured. (1)
- 4.2 a) Nylon (3)  
b) Neoprene  
c) Gore-tex pro

## INDIGENOUS HOMES

### Question 1

Dome-shaped

(1)

### Question 2

	Informal	Indigenous
Suitability	Usuitable	Suitable – can be designed according to your needs.
Availability	Materials are not readily available.	Materials are readily available.
Environmentally friendly	Not attractive.	Blends into the general environment.

## 9 Impact of Technology

### Question 1

Fire, writing, wheel and axle, steam engine, electricity, flight, digital technology.

Any THREE correct examples

(3)

### Question 2

2.1 Any TWO correct examples which can include ...

(2)

*Jaws of life:* This is a hydraulic system that has helped emergency workers cut accident victims out of cars quickly and easily.

*Emergency shelters:* New technology allows designers to design and produce emergency shelters which are cheap to manufacture and meet all of the needs of the people who they are intended for. This helps reduce the negative effect of refugees being displaced from their homes.

*Protective clothing:* New textiles, that have been developed through new technologies, help protect emergency workers, helping them save lives.

2.2 Any correct example which an include ...

(2)

*Visual pollution:* This is the effect that pollution can have on someone enjoying the visual environment around them. Electrical pylons and cell phone towers are good examples of technology that can cause visual pollution. They detract from the aesthetic appeal of the environment that they are erected in.

2.3 *Recycling*

(2)

Recycling plastics and other waste products helps to largely reduce the negative impact of technology. This process also provides people with income opportunities.

*Good design*

(2)

Designers work hard at making sure that new structures that are built do not add to any visual pollution but instead add a positive visual to the environment they are built in.

**Question 3**

- 3 marks for design.
- 3 marks for neatness.

