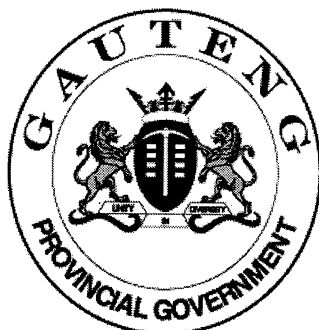


# SENIOR CERTIFICATE EXAMINATION



**FEBRUARY / MARCH  
2006**

**WOODWORK**

**SG**

**Second Paper : Theory**

**720-2/2 E**

WOODWORK SG: Paper 2



720 2 2E

SG

18 pages

**X05**



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GAUTENG DEPARTMENT OF EDUCATION

SENIOR CERTIFICATE EXAMINATION

WOODWORK SG  
(Second Paper: Theory)

TIME: 2 hours

MARKS: 100

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**INSTRUCTIONS:**

- Answer ALL the questions.
  - Sketches may be used to illustrate your answers.
  - Start each question on a new page.
  - Answer Question 1A on the **answer sheet** on the **inside cover** of your **answer book**.
- 
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**QUESTION 1A**  
**MULTIPLE-CHOICE QUESTIONS**

Carefully study the statements and questions below and, in each case, choose the most correct answer from A, B, C or D. Indicate your answer by making a cross (X) over the appropriate letter on the answer sheet on the **inside cover** of your **answer book**.

- 1.1 Conifers are usually associated with \_\_\_\_\_.
- A. softwoods
  - B. exotic timbers
  - C. hardwoods
  - D. indigenous timbers
- 1.2 Timbers growing in South Africa which are used for the manufacture of furniture:
- A. Stinkwood, Kiaat, Yellowwood, Pine
  - B. Yellowwood, Imbuia, Beech, Oak
  - C. Pau Marfin, Tamboti, Stinkwood, Oregon pine
  - D. Iroko, Sapele Mahogany, Imbuia, Kiaat

- 1.3 The conversion of timber occurs when the timber has been \_\_\_\_\_.
- A. changed from softwood into hardwood by too rapid drying
  - B. moved from the forest to the sawmill
  - C. stained to imitate another type of timber
  - D. sawn into usable sections
- 1.4 What makes a mitre square different from an ordinary try square?
- A. It can test flat surfaces to see if they are true.
  - B. The blade can be adjusted.
  - C. Any size angle can be tested.
  - D. The bar is skew so that 45° angles can be tested.
- 1.5 Which one of the following callipers will be used to draw lines parallel to straight or curved surfaces?
- A. Dividing compass
  - B. Hermaphrodite calliper
  - C. Outside calliper
  - D. Inside calliper
- 1.6 Which one of the following planes will be used to plane a long edge straight?
- A. Trying plane
  - B. Jack plane
  - C. Router plane
  - D. Smoothing plane
- 1.7 Setting the teeth of a saw means to \_\_\_\_\_.
- A. file the top of the teeth to an even height
  - B. bend them to the left and right alternately
  - C. sharpen them
  - D. shape them according to the type of saw
- 1.8 The size of a cross cut saw is determined by the \_\_\_\_\_.
- A. weight of the saw
  - B. length of the blade as well as the tooth pitch
  - C. size of the handle
  - D. wood that has to be cut
- 1.9 The rose countersink bit is used to \_\_\_\_\_.
- A. countersink holes for screw-heads in hard wood
  - B. countersink holes for screw-heads in soft wood
  - C. drill holes for countersunk screws
  - D. drill holes through thin metal

- 1.10 The size of a cross-pene hammer is determined by the \_\_\_\_\_.
- A. length of the handle
  - B. weight of the head
  - C. area of the face
  - D. size of the nails
- 1.11 A nail punch is used to \_\_\_\_\_.
- A. mark holes for drilling
  - B. make a hole for a nail
  - C. drive nail heads under the surface of the wood
  - D. remove nails
- 1.12 What will the result be if a screwdriver with a tip narrower than the screw slot is used?
- A. It will break the screw head.
  - B. A good grip
  - C. It will not fit deep enough into the slot.
  - D. It will damage the screw slot.
- 1.13 The angle of the grinding bevel of chisels is sharpened between \_\_\_\_\_.
- A. 20° to 25°
  - B. 25° to 30°
  - C. 30° to 35°
  - D. 35° to 40°
- 1.14 The size of a band saw is determined by the \_\_\_\_\_.
- A. measurements of the table
  - B. height of the band saw
  - C. width of the blade
  - D. distance between the saw blade and the arm
- 1.15 Which of the following does **not** determine the flatness of a jointer-planed surface?
- A. The number of knives in the cutter head
  - B. The speed of the cutter head
  - C. The speed at which the stock is fed over the cutter head
  - D. The width of the cutter head

- 1.16 To attach the stock for a turned bowl on a wood lathe, use \_\_\_\_\_.
- A. the live centre
  - B. the index pin
  - C. a face plate
  - D. a roller bearing centre
- 1.17 Timber with a high oil content could be joined as follows for a table top:
- A. F-joint
  - B. Tongue and groove joint
  - C. Dovetail joint
  - D. Slot and screw joint
- 1.18 The slope for dovetails used in hardwood is \_\_\_\_\_.
- A. 1:2
  - B. 1:4
  - C. 1:8
  - D. 1:10
- 1.19 Which one of the following is **not** a characteristic of the contemporary furniture style?
- A. Solid wood
  - B. Mass production
  - C. Machine made
  - D. Earlier styles copied
- 1.20 Weathering of timber is caused by \_\_\_\_\_.
- A. beetles
  - B. termites
  - C. sun, rain and wind
  - D. seasoning

(20)

**QUESTION 1B**

Carefully study the given word or phrase at each question number. Then, read the details in Columns A, B and C. Next, choose the word, phrase or symbol for Column A, B or C that best describes the word or phrase listed from Question 1.21 to 1.30. Write only the question number and the correct answer (A, B or C) in your answer book.

		<b>A</b>	<b>B</b>	<b>C</b>
1.21	Indigenous hardwood	Kiaat	Imbuia	Real yellowwood
1.22	Construction wood	XX	V 4	KH
1.23	A defect	Coarse texture	Spiral grain	Fine texture
1.24	Face-edge mark	Λ	+	ƒ
1.25	Widening joint	Dovetail joint	Finger joint	F-joint
1.26	Sawing of curves	Tenon saw	Coping saw	Panel saw
1.27	Mortising attachment	Drill press	Portable electric drill	Ratchet brace
1.28	Well-known designer of furniture	Lloyd	Hepplewhite	Bugatti
1.29	Retention of preservatives	Degree of poisonousness of the preservative	Quantity of agent penetrating the timber	Quantity of agent that remains in the timber
1.30	Bleaching	The process through which the colour of the wood can be changed	The process through which timber can be treated against insects	The process through which the colour of wood can be made lighter

(10)

**Table 1.2**

**[30]**

**QUESTION 2**  
**TIMBERS, CONVERSION METHODS, DEFECTS AND GRADING**

**2.1 Timbers**

**Table 2.1** provides various facts on timber. In your answer book, write down the letters **A** to **Q** below one another. Read the rows vertically and use the information provided to find the answers. Write only the number of the relevant fact next to the correct letter **A** to **Q**. For example, A – 1, B – 2, etc.

	Distribution	Colour of heartwood	Odour	Texture	Contains	Working properties
	1. Zambia 2. Knysna (SA) 3. Uganda 4. Britain 5. Mpumalanga 6. Brazil 7. Japan 8. USA 9. South America	1. Varies from yellow-brown to chocolate brown 2. Light brown to dark brown 3. Red-brown to dark brown 4. Golden brown 5. Yellow-brown to red-brown 6. Light red-brown 7. Dark red 8. Yellow	1. Cedar 2. Spicy 3. Resin 4. Sweet 5. Unpleasant 6. Curry-like 7. None	1. Fine 2. Medium 3. Rough 4. Even	1. Oil 2. Resin 3. Gallic acid 4. Salt crystals	1. Planes very easily 2. Tearing 3. Grainfilling necessary 4. Makes tools blunt 5. Bent with steam treatment
Beech			<b>G</b>			
Real Yellowwood				<b>J</b>		
Imbuia		<b>D</b>				
Iroko				<b>K</b>		<b>P</b>
Japanese Oak					<b>M</b>	<b>Q</b>
Kiaat			<b>H</b>			
Oregon pine		<b>E</b>				
Pau Marfin	<b>A</b>					
S.A. pine	<b>B</b>			<b>L</b>	<b>N</b>	
Sapele mahogany			<b>I</b>			
Stinkwood	<b>C</b>					
Tamboti		<b>F</b>			<b>O</b>	

(17)

**Table 2.1**

**2.2 Conversion of timber**

2.2.1 Name FOUR factors which will determine the conversion method to convert logs. (4)

2.2.2 Name and sketch TWO conversion methods. (6)



**2.3 Defects in timber**

- 2.3.1 Heart rot is a defect that occurs in some growing tree trunks.
- (a) Make a neat sketch to illustrate heart rot. (1)
  - (b) What is the cause of heart rot in growing tree trunks? (2)
  - (c) Which South African timber is generally known for heart rot? (1)
- 2.3.2 Make a neat sketch to illustrate star shake that occurs in logs. (1)
- 2.3.3 What is the cause of star shake? (1)
- 2.3.4 What are waney edges? When do waney edges occur in boards? (2)
- 2.3.5 Knots in timber may sometimes be seen as decoration but in general they are seen as a defect. Name TWO reasons why. (2)

**2.4 Grading of timber**

- 2.4.1 Why is it necessary for timber to be graded? (2)
- 2.4.2 Which authority in South Africa is responsible for the grading of timber? (1)

**[40]****QUESTION 3**  
**HAND AND MACHINE TOOLS**

- 3.1 The lifespan of hand tools depends on how they have been taken care of. State TWO precautionary measures that are important when taking care of the following tools:
- 3.1.1 Steel folding ruler
  - 3.1.2 Tenon saw
  - 3.1.3 Jack plane (6)
- 3.2 When setting out a dowel joint you need to mark out the centre of the rail. Briefly explain how to mark out the centre using a single-pin marking gauge. (3)

3.3 Match the following planes (A to C) with the given uses (3.3.1 – 3.3.4). (For example 3.3.5 – D)

- A. Smoothing plane
- B. Jack plane
- C. Trying plane

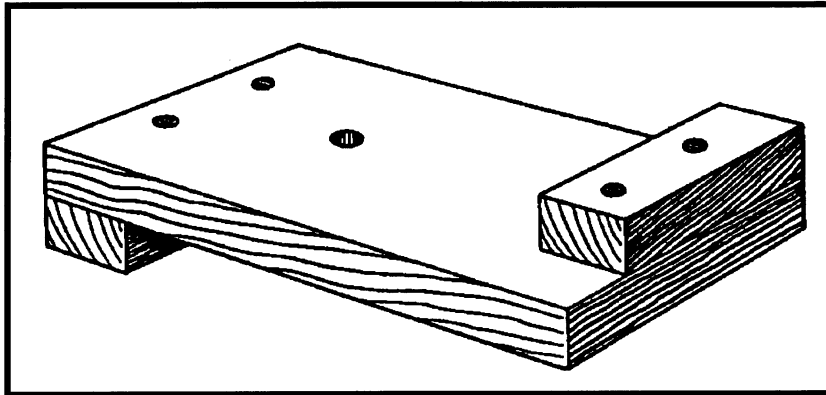
3.3.1 To plane wood to the required dimensions (breadth and thickness)

3.3.2 Clean shaving of completed work

3.3.3 Straight planing of long, rough edges and surfaces

3.3.4 Fine planing on cross grain wood (4)

3.4 **Figure 3.4** shows a handy aid when sawing is done.



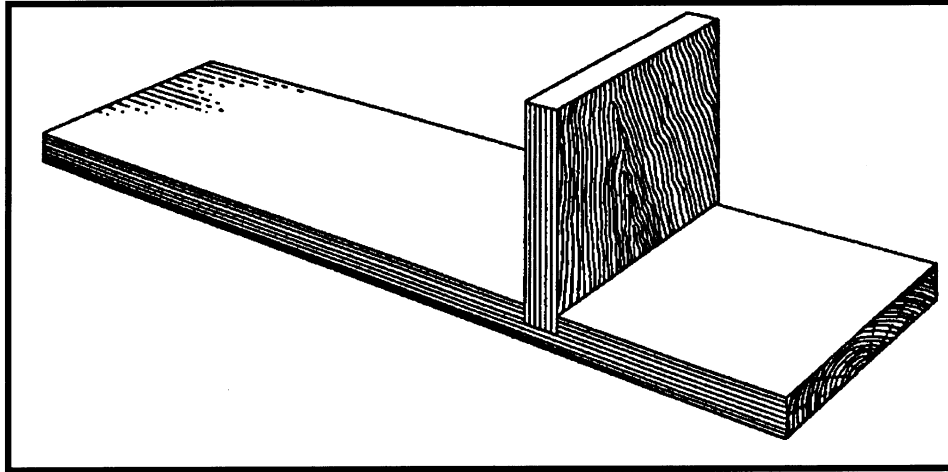
**Figure 3.4**

3.4.1 What is this aid called? (1)

3.4.2 Which saw will be used with this aid? (1)

3.4.3 Except for sawing, what else can it be used for? (1)

3.5 **Figure 3.5** shows a through housing joint.



**Figure 3.5**

Describe, step by step, how you will make this joint by using **hand tools**. Refer to the following:

3.5.1 Marking out (5)

3.5.2 Removal of excess material (5)

Note: Refer to the hand tools you will use.

### 3.6 **The belt and disk sander**

Briefly describe the steps that must be followed to replace the sanding belt. Keep the following in mind:

- The tension of the belt
- Aligning (4)

### 3.7 **The band saw**

Explain by means of a sketch how you will use rough cuts (tangential or radial) to cut small curves. (2)

### 3.8 **The circular saw**

3.8.1 At what height will you adjust the blade above the stock when ripping is done? (1)

3.8.2 Which safety equipment prevents the cut from pinching? (2)

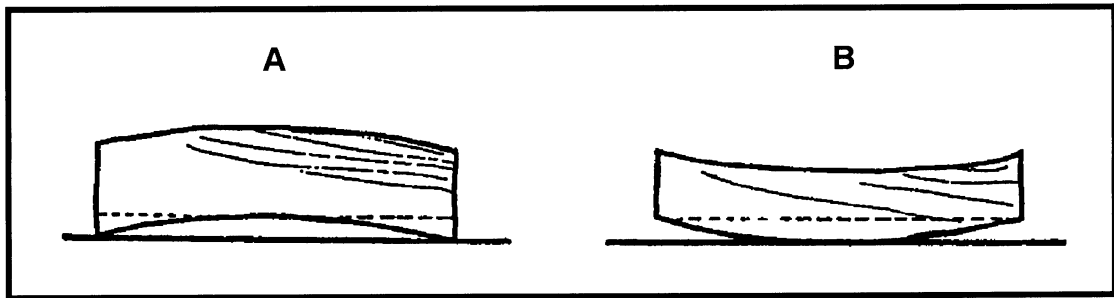
### 3.9 **The thicknesser**

Why should stock be checked thoroughly before it is planed? (2)

### 3.10 The jointer

3.10.1 The jointer is one of the most dangerous machines in the woodwork centre. State THREE safety measures which should be obeyed **while** you are busy planing a 400 mm long board. (3)

3.10.2 **Figure 3.10.2** shows two methods of how to plane a curved board.



**Figure 3.10.2**

(a) Which method would you choose, **A** or **B**? (1)

(b) What is your reason for choosing this method? (2)

### 3.11 The wood turning lathe

Illustrate FOUR steps you will follow when preparing to mount a 50 x 50 x 600 mm piece of wood for turning between the centres of a lathe. Sketches may be used to illustrate your answer. (4)

### 3.12 Portable power tools

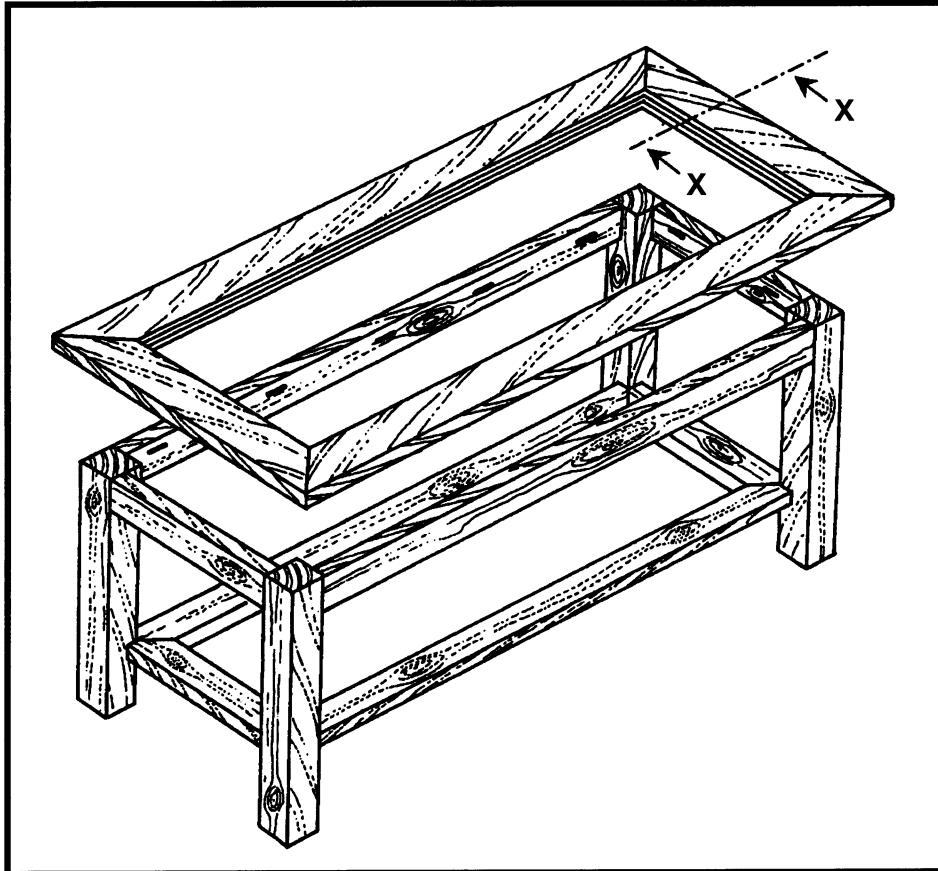
3.12.1 Which portable sander will you use to work big surfaces to an even level? (1)

3.12.2 Briefly describe the sanding process. (2)

**[50]**

**QUESTION 4**  
**CONSTRUCTION AND WOODWORKING JOINTS**

- 4.1 **Figure 4.1** shows a coffee table which is made of solid wood. The top consists of a frame with a rebate on the inner side to fit 6 mm glass. Study the sketch and answer the questions that follow.

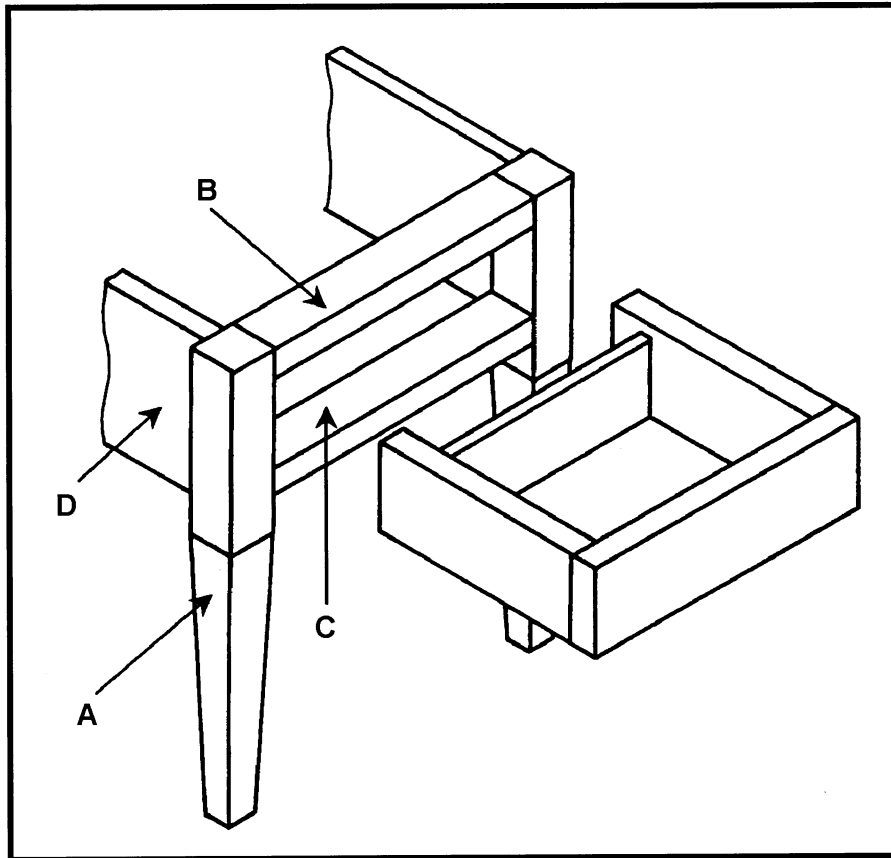
**Figure 4.1**

- 4.1.1 Which joint is used to join the corners of the top frame? (1)
- 4.1.2 Which joint will you use to join the top rails to the legs? (1)
- 4.1.3 Make a neat sketch of section **XX** as shown in **Figure 4.1**.

The following must be shown:

- The rebate for the glass
  - An edge pattern on the outside edge of the frame (2)
- 4.1.4 The upper rails have small grooves which will be used to secure the top to the frame of the table. Show by means of a sketch how you will do it. (3)

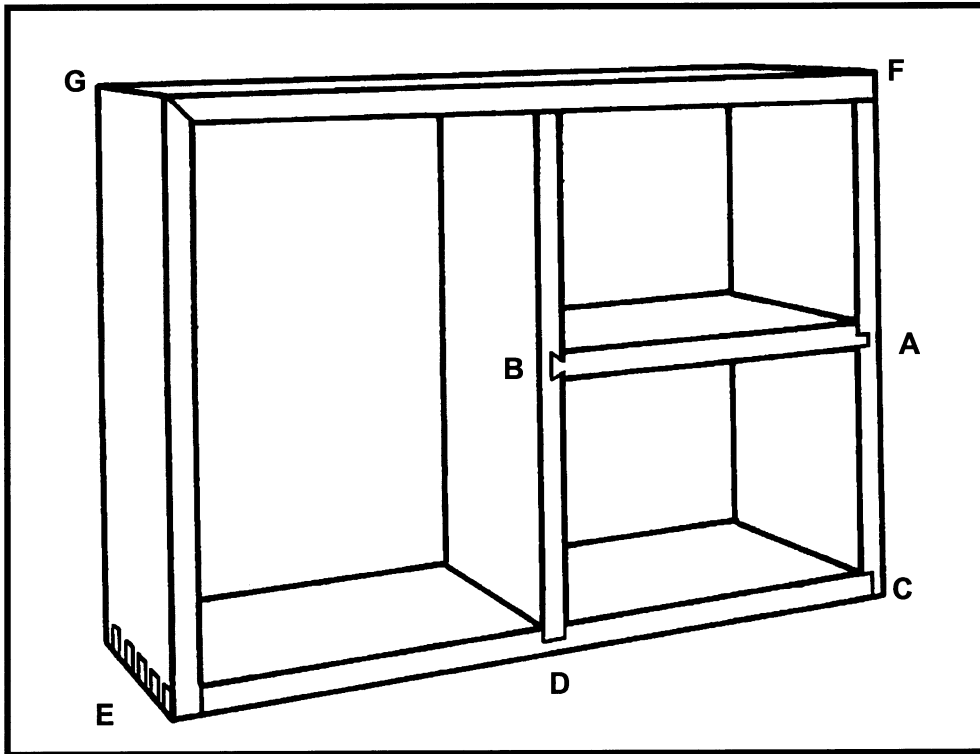
- 4.2 **Figure 4.2** shows a partial construction of a chess table with a drawer. Study the sketch and answer the questions that follow.



**Figure 4.2**

- 4.2.1 Write the letters **A – D** beneath one another and name each specific part. (4)
- 4.2.2 Give the name of the joint which you will use to join
- (a) **B to A.**
  - (b) **C to A.**
  - (c) **D to A.**
- (3)
- 4.2.3 The table construction, as shown in **Figure 4.2**, does not make provision for drawer support. Explain by means of a labelled sketch the construction you would use to keep the drawer in position and let it slide. (4)

4.3 **Figure 4.3** shows a case construction. Study the sketch and answer the questions that follow.



**Figure 4.3**

- 4.3.1 Write the letters **A** to **F** beneath one another in your answer book and next to each, name the joint used. (6)
- 4.3.2 Name **TWO** methods used to strengthen the joint at **F**. (2)
- 4.3.3 How will you strengthen the joint at **G**? (2)

4.4 Figure 4.4 shows a door frame with a solid panel.

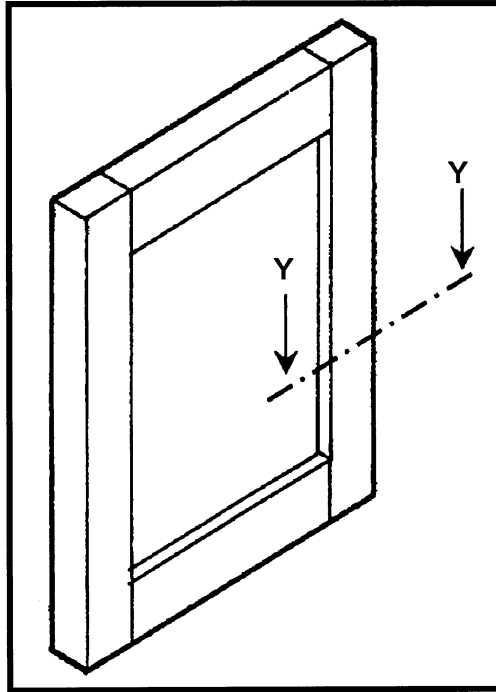


Figure 4.4

- 4.4.1 Make a neat sectional sketch of the door frame and panel on cutting plane Y – Y. (3)
- 4.4.2 Which joint will you use on the corners of the frame? (1)
- 4.4.3 Is the panel fixed with glue to the frame? Answer yes or no. (1)
- 4.4.4 Give a reason for your answer to Question 4.4.3. (2)

#### 4.5 The glue process

Briefly describe the glueing process under the following headings:

- 4.5.1 Preparation of the wood (2)
- 4.5.2 Application of the glue (1)
- 4.5.3 Reasons for using clamps (2)

[40]



**QUESTION 5  
PRESERVATION, FINISHING AND DESIGN****5.1 Preservation of timber**

- 5.1.1 State THREE favourable conditions that will make fungi active. (3)
- 5.1.2 Name TWO diseases that are caused by fungi. (2)
- 5.1.3 Name TWO biological factors (organisms) other than fungi, that will break down timber. (2)
- 5.1.4 State the name of a preservative that is particularly suitable for outdoor use. (1)
- 5.1.5 The choice of preservative processes is determined by certain factors. Name TWO such factors. (2)

**5.2 Finishing of wood**

How will you complete the final finishing in the following cases?

- 5.2.1 Preparing an oil-containing wood for a protective coating
- 5.2.2 Changing the colour of Kiaat's sapwood to the same colour as the heartwood
- 5.2.3 Special preparation of the surface of timber with a rough texture (for example Kiaat) for a good finish
- 5.2.4 Sanding early wood and late wood (for example pine) to an even surface
- 5.2.5 The direction in which you would sand wood when sanding by hand (5)

Which grade (grit) of sandpaper (40, 80, 120, 220 or 600) will you use for the following?

- 5.2.6 To complete the final finishing to the top of a small table before polishing it
- 5.2.7 To remove (strip) paint from an old door
- 5.2.8 To prepare a project for a second coat of varnish. (3)

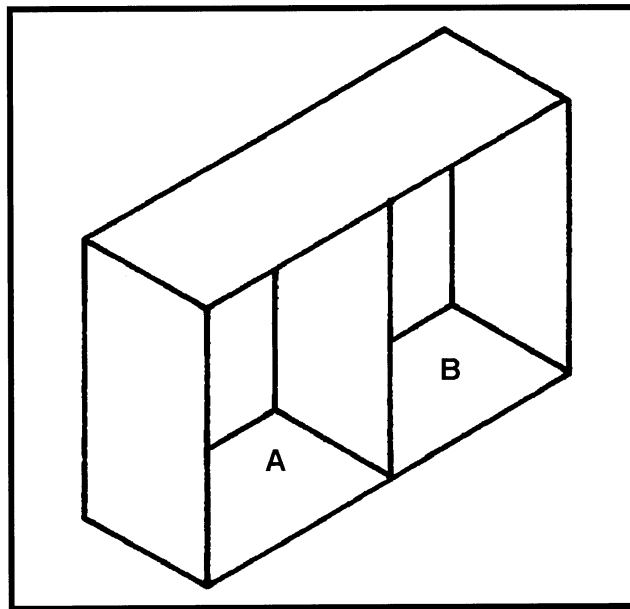
**5.3 Polishing of wood**

5.3.1 Which type of protective coating would you prefer to use on a piece of furniture? (1)

5.3.2 What is the reason for your answer to Question 5.3.1? (1)

**5.4 Design**

**Figure 5.4** shows the outer lines of a cabinet.



**Figure 5.4**

5.4.1 By keeping the proportions as proposed in **Figure 5.4**, design a bathroom wall cabinet with the following specifications in mind. Sketch freehand a front view and a left view.

- (a) Space **A** is closed by means of door with a mirror. (6)  
(b) Space **B** must have a shelf in the middle and is left open. (6)

5.4.2 Show by means of a sketch how you will secure the cabinet to the wall. (2)

5.4.3 What will determine the height of the cabinet from the floor? (2)

5.4.4 State FOUR principles of design to which the above-mentioned cabinet should measure up. (4)

5.5 After the arrival of settlers at the Cape, there was a greater demand for furniture and in time a particular furniture style developed.

5.5.1 Name TWO timbers which were initially used on a large scale. (2)

5.5.2 State FOUR other characteristics of the Cape furniture style. (4)  
**[40]**

**TOTAL: 200÷2=100**