SENIOR CERTIFICATE EXAMINATION

FEBRUARY / MARCH

2007

WOODWORK

SG

Second Paper : Theory

720-2/2 E

WOODWORK SG: Paper 2

17 pages

720 2 2E SG

X05

GAUTENG DEPARTMENT OF EDUCATION

SENIOR CERTIFICATE EXAMINATION

WOODWORK SG
(Second Paper: Theory)

TIME: 2 hours

MARKS: 100

INSTRUCTIONS:

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

QUESTION 1 A
MULTIPLE-CHOICE QUESTIONS

The multiple-choice questions that follow cover the full syllabus.

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**.

Timbers

1.1 This kind of timber is an indigenous conifer.

A. Stinkwood
B. Real yellowwood
C. Kiaat
D. Tamboti

1.2 The under-mentioned timber is indigenous to the USA but planted in South Africa.

A. Patula pine
B. Imbuia
C. Eliotti pine
D. Beech

1.3 The SABS mark ensures the user that _____ .

A. the product's price is correct
B. the product meets the requirements of the job for which it is intended
C. the product's moisture content is correct
D. the product is not too old

1.4 Conifers for construction purposes are marked as follows:

A. MG
B XX
C. M6
D. FC

1.5 This timber is known to get heart rot.

A. Tamboti
B. Yellowwood
C. Pau Marfin
D. Imbuia

Hand tools

1.6 Which precautionary measure does <u>not</u> apply to hand tools?

A. Regularly inspect tools for defects.
B. Clean regularly with a damp cloth.
C. Touch metal parts as little as possible.
D. When rust occurs, use steel wool to polish the metal.

1.7 The size of a mortice chisel is determined by the _____ .

A. mass of the blade
B. number of ferrules on the handle
C. length of the blade
D. width of the blade

1.8 Rasps are used for _____ .

A. squaring wood
B. finishing joints
C. shaping work in wood
D. None of the above mentioned.

1.9 What makes the paring chisel ideal for working off inside corners?

A. The slanted sides
B. The sharp blade
C. The small tip
D. A curved handle

1.10 If a countersink bit is not available, the following bit could be used.

A. Morse twist drill
B. Auger bit
C. Centre bit
D. Flat bit

1.11 This plane is used for the straight planing of long, rough edges and surfaces.

A. Router plane
B. Jack plane
C. Smoothing plane
D. Trying plane

1.12 This hammer is used for hammering in small panel pins.

A. Claw hammer
B. Carpenter's mallet
C. Cross pene hammer
D. Ball pene hammer

1.13 Which oilstone is the artificial stone?

A. Washita
B. Arkansas
C. Turkish stone
D. Carborundum oil stone

Machine tools

1.14 When the scraping technique is used on the lathe, the tool rest should be adjusted as follows:

A. Precisely on the centre of the wood
B. The tool rest is not used.
C. Above the centre of the wood
D. Below the centre of the wood

1.15 To drill holes of even depth on the drill press, use the _____ .

A. depth pin
B. rule
C. G-cramp and a piece of wood
D. stopper

1.16 Sash clamps are arranged alternatively on the top and bottom to glue a table top for the following reason:

A. It is easier
B. There will be more space
C. It will keep the surface level
D. It will even the weight

Miscellaneous

1.17 This beetle only attacks green timber.

A. Powder post beetle
B. Ambrosia beetle
C. Furniture beetle
D. European house borer

1.18 This refers to the quantity of preservative that remains in the wood after the treatment process has been completed:

A. Absorption
B. Penetration
C. Permeability
D. Retention

1.19 Proportion (as a principle of design) refers to the _____ between dimensions, surface, mass and form.

A. harmony
B. simplicity
C. style
D. adequate use

1.20 Which one of the following is <u>not</u> a factor that influences the design of home furniture?

A. Climate conditions
B. Available material
C. Prevailing fashion
D. Craftsmanship (20)

QUESTION 1 B

Carefully study the given word or phrase at each question number. Then read the details given in **Columns A**, **B** and **C**. Next choose the word or phrase from Column A, B or C that best describes the word or phrase listed from 1.21 to 1.30. Indicate your answer by making a cross (**X**) over the appropriate letter on the **answer sheet** on the **inside cover** of your **answer book**.

		Column A	Column B	Column C
1.21	**Suitable for structural wood**	Beech	Kiaat	S.A. pine
1.22	**Steam bending**	Oak	Iroko	Imbuia
1.23	**Ratchet wheel**	Hand drill	Brace	Smoothing plane
1.24	**Mortice gauge**	Marking of dovetail joints	Half-lapped joints	Marking of mortice and tenon joints
1.25	**Making of drawer dovetail joints**	Portable jig saw	Bandsaw	Portable router
1.26	**Extracting nails**	Carpenter's mallet	Pincers	Cutting pliers
1.27	**Faceplate**	Drill press	Lathe	Sander
1.28	**Coarse sanding paper**	40	80	120
1.29	**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
1.30	**Contemporary furniture**	Oil finishing	Synthetic varnishes	French polish

Table 1.2

(10)
[30]

QUESTION 2
TIMBERS, CONVERSION METHODS, DEFECTS AND GRADING

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

	Distribution: 1. Zambia 2. Knysna (SA) 3. Uganda 4. Britain 5. Mpumalanga 6. Brazil 7. Japan 8. USA 9. South-America	**Colour of heartwood:** 1. Varies from straw, grey, brown to almost black 2. Light brown with pink sheen 3. Red-brown to dark brown 4. Golden brown 5. Yellow brown to red-brown 6. Reddish 7. Dark red 8. Yellow	**Odour:** 1. Cedar 2. Spicy 3. Resin 4. Sweet 5. Unpleasant 6. Curry-like 7. None	**Texture:** 1. Fine 2. Medium 3. Rough 4. Even	**Contains:** 1. Oil 2. Resin 3. Gallic acid 4. Salt crystals	**Uses:** 1. Construction work 2. Tool handles 3. Used as contrasting colour in expensive furniture
Beech						**O**
Real Yellowwood						**P**
Imbuia			**G**	**J**		
Iroko		**D**				
Japanese Oak				**K**	**M**	
Kiaat	**A**		**H**			
Oregon pine						
Pau Marfin				**L**		
S.A. pine	**B**	**E**	**I**		**N**	
Sapele mahogany						
Stinkwood		**F**				
Tamboti	**C**					

Table 2.1 (16)

2.2 Conversion of timber

2.2.1 State FOUR factors that will determine the method of conversion when converting logs into boards. (4)

2.2.2 Name and sketch the method which is mainly used to convert broad-leaf species into boards where the general direction of the rays runs parallel to the width of every board (radial sawn). (2)

2.2.3 **Figure 2.2.3** shows the cross-cutting method.

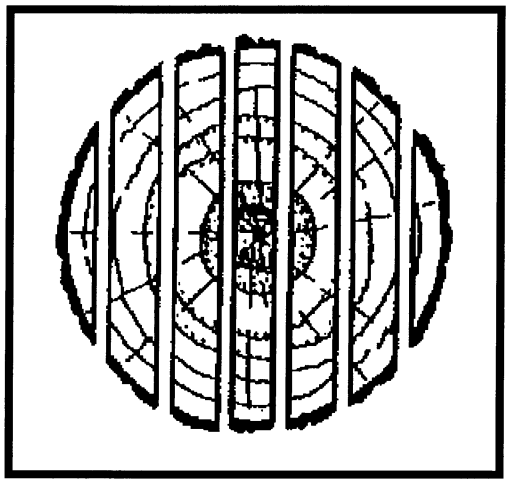

Figure 2.2.3

a) What is the saw called that is used for above mentioned method? (1)

b) State THREE advantages of this method over other methods. (3)

2.3 Defects in timber

2.3.1 Star shake is a defect that occurs with felled logs:

a) Make a neat sketch to illustrate a star shake. (1)

b) What is the cause of a star shake? (2)

2.3.2 Make a neat sketch to illustrate heart rot that occurs in growing tree trunks. (1)

2.3.3 What is the cause of heart rot? (2)

2.3.4 Make a neat sketch to illustrate cupping that occurs in converted boards. (1)

2.3.5 What is the cause of cupping? (2)

2.3.6 Name and sketch any other TWO forms of warping that occur in converted boards. (4)

2.4 **Grading of timber**

Which authority in South Africa is responsible for the grading of timber? (1)

[40]

QUESTION 3
HAND AND MACHINE TOOLS

3.1 The lifetime of hand tools depends on the care taken of them. State TWO important precautionary measures that are important when taking care of the following tools:

3.1.1 Try square

3.1.2 Firmer chisel

3.1.3 Smoothing plane (6)

3.2 How can a try square be tested for squareness? (2)

3.3 Match the following saws (3.3.1 – 3.3.4) with the given uses (A – F) (For example, 3.3.1 – A). Show ONE use per saw.

3.3.1 Cross-cut saw	A.	To cut wood to the required length
3.3.2 Rip saw	B.	To saw curves in thin plywood
3.3.3 Back saw	C.	To cut wood to the required width
	D.	To saw shoulders and tenons of joints
3.3.4 Coping saw	E.	To saw with or across the grain of wood
	F.	To saw keyholes

(4)

3.4 A classmate has cut himself with a chisel and needs your assistance urgently.
What precautionary measures would you take to safeguard yourself against possible infection from a virus? (2)

3.5 **Figure 3.5** shows a tongue and groove joint.

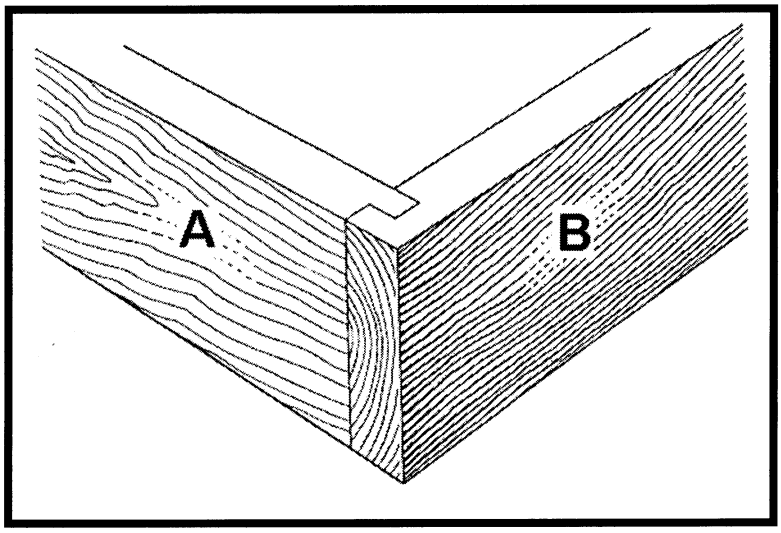

Figure 3.5

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

3.5.1 Preparation (2)

3.5.2 Marking out of the joint (5)

3.5.3 Removing of access material (5)

Note: Refer to the hand tools you will use.

3.6 **The drill press:**

3.6.1 Briefly describe how you will set the speed of the drill press. (3)

3.6.2 State any Three safety measures which will apply when fitting a drill bit to the chuck. (3)

3.7 **The circular saw:**

3.7.1 Briefly describe how you will set the blade square. (5)

3.7.2 When doing ripping, how will you set the saw to cut to a specific width? (4)

3.8 **The thicknesser:**

3.8.1 After switching on the machine, you should wait a moment before you can push the board through the machine. Why? (1)

3.8.2 **Figure 3.8.2a** shows the cutter head (2) and the direction of turning.
Figure 3.8.2b shows a side view of a board with its ends marked **A** and **B**.

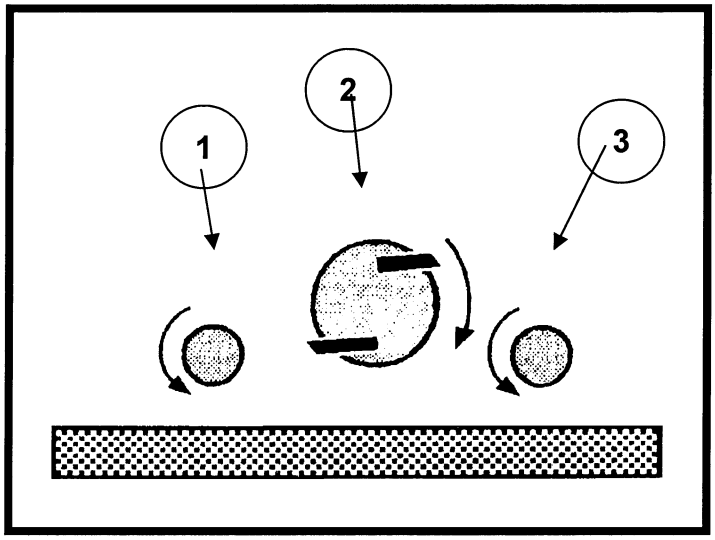

Figure 3.8.2 (a)

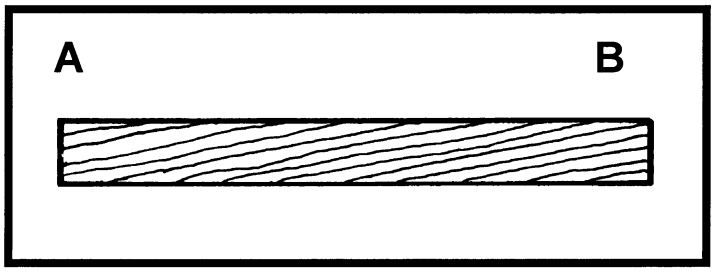

Figure 3.8.2 (b)

a) Which end, A or B, will you feed in first? (1)
b) What is your reason for the above mentioned answer? (2)
c) What is the function of parts **1** and **3**? (2)

3.9 **Portable power tools:**

State any THREE safety measures which should be applied when working with a portable jig saw (not personal safety measures). (3)
[50]

QUESTION 4
CONSTRUCTION AND WOODWORKING JOINTS

4.1 State THREE reasons why woodwork joints are used. (3)

4.2 **Widening joints** are used to join a number of narrow boards (side by side) to produce, for example, table tops.

4.2.1 Which joint is the most simple to make? (1)

4.2.2 Briefly describe how you will make this joint. (3)

4.2.3 Name and sketch TWO joints that could be used for big and heavy table tops. (4)

4.2.4 Name a joint that could be used to join oil-containing wood. (1)

4.3 **Figure 4.3** shows a sketch of a picture frame.

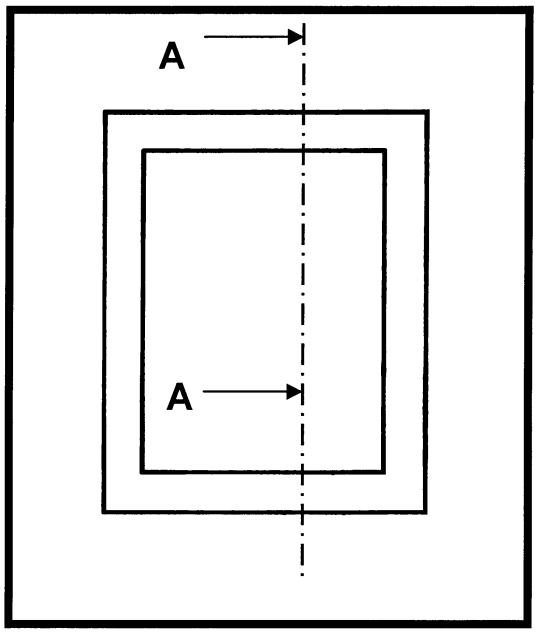

Figure 4.3

4.3.1 Name and sketch the joint that is generally used to join picture frames. (2)

4.3.2 What will you do to strengthen the joint? (1)

4.3.3 Draw freehand a cross-section through the frame (cutting plane A-A) showing the following:

a) The frame
b) The glass
c) The position of the picture
d) The back
e) Fixing (5)

4.4 **Figure 4.4** shows a sketch of a doorframe with a solid raised panel.

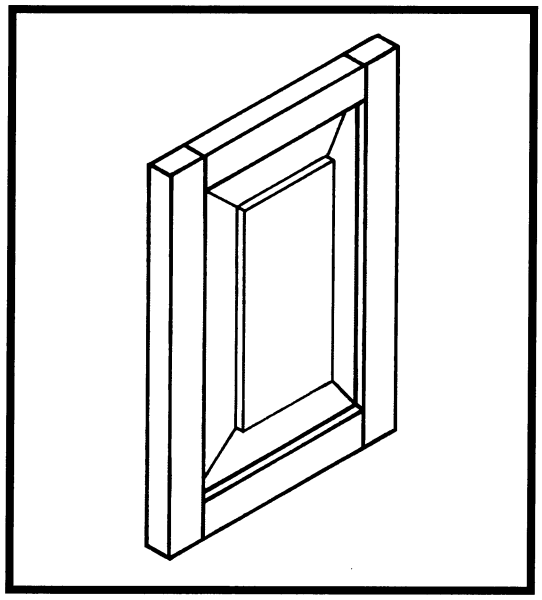

Figure 4.4

4.4.1 Which joint is used to join the stiles and rails? (2)

4.4.2 Draw freehand a cross-section of the frame showing the following:
a) One stile
b) Part of the raised panel (4)

4.4.3 Would you glue the panel to the frame? Yes or no. (1)

4.4.4 What is the reason for your answer in Question 4.4.3? (2)

4.5 **Figure 4.5** shows a sketch of a cabinet with shelves.

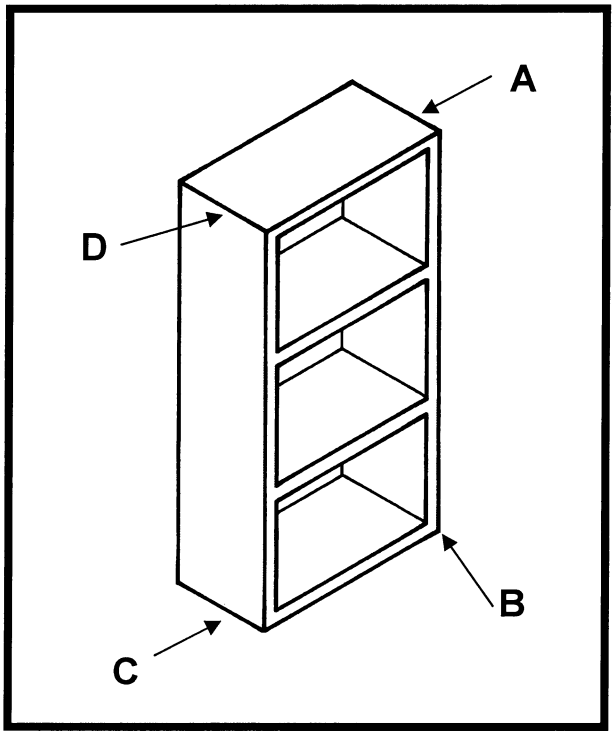

Figure 4.5

4.5.1 Write the letters A – D underneath each other and next to it the names of four different joints that could be used in this case.
Note: The name of the joint mentioned in Question 4.3 should **not** be used. (4)

4.5.2 Name and sketch the joint you will use to join the shelves.
Note: The joint must not be visible from the front. (3)

4.6 **Figure 4.6** shows the front view of a drawer.

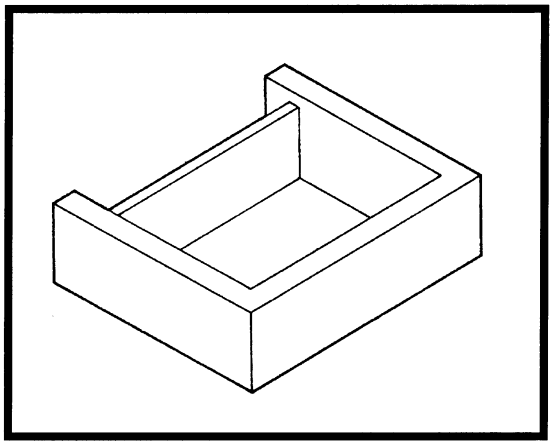

Figure 4.6

Copy **Figure 4.6** and show the mechanism that keeps the drawer in position and enables it to slide. (4)

[40]

QUESTION 5
PRESERVATION, FINISHING AND DESIGN

5.1 **Preservation of timber**

5.1.1 State THREE conditions in which fungi will be active. (3)

5.1.2 What is the function of preservatives? (2)

5.1.3 Preservatives can be grouped into three classes. Name ONE. (1)

5.1.4 State the name of a preservative which you will recommend for outdoor use. (1)

5.1.5 Briefly describe, step by step, the full cell process that is used to preserve timber. (10)

5.2 Finishing of wood

5.2.1 After a project has been completed it should be treated with a protective coating. State THREE reasons for this. (3)

5.2.2 Before any protective coating can be applied to wood, certain processes should be completed. Name THREE. (3)

5.2.3 State the type of protective coating that you would prefer to use for a coffee table. (1)

5.2.4 Give THREE reasons why you prefer the coating mentioned in Question 5.2.3. (3)

5.3 Design

5.3.1 **Figure 5.3 (a)** shows the side view of a dining room chair.

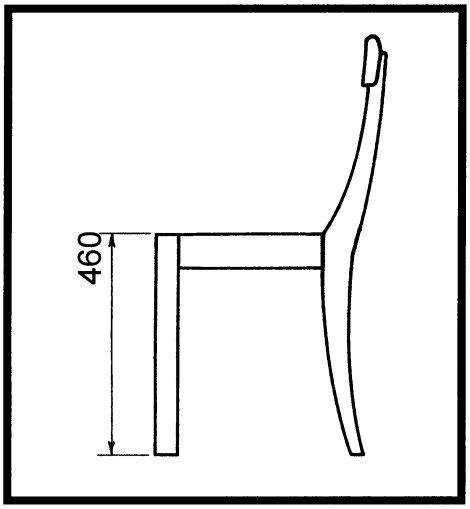

Figure 5.3 (a)

Figure 5.3 (b) shows a number of basic wood turning profiles.

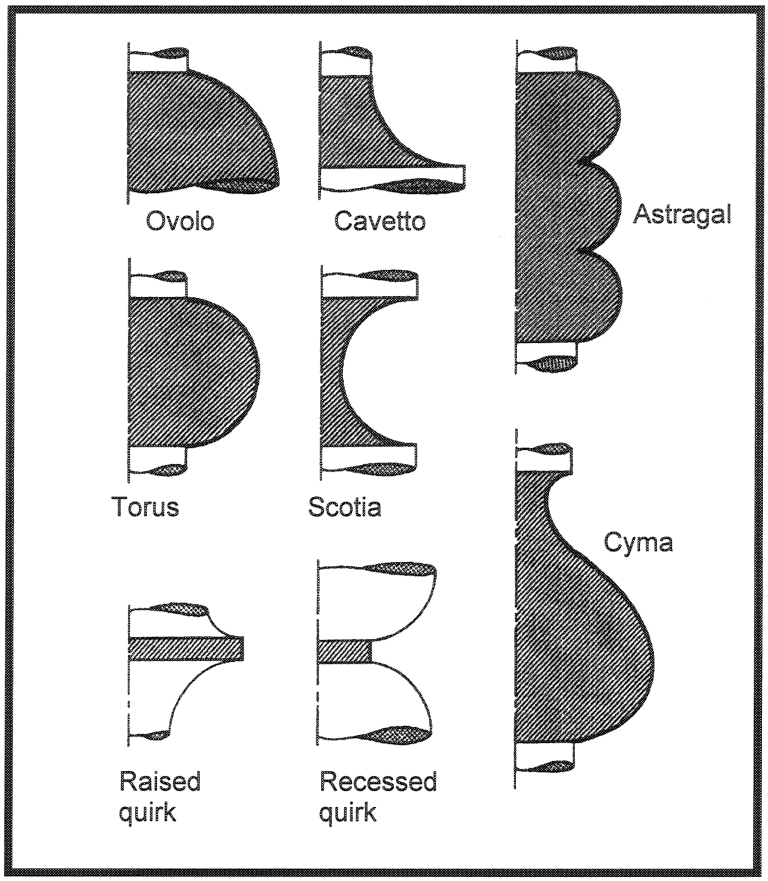

Figure 5.3 (b)

Use a pencil and ruler to design and draw a turned front leg for the chair by using the following criteria:

a) Draw according to a scale of 1: 5
b) The thickness of the leg is 50 x 50 mm
c) Make use of at least 4 basic turning profiles from **Figure 5.3 (b)**
d) The piece where the rails join should not be turned.

Note: Marks will be allocated for the correct use of the basic turning profiles as well as the ratio thereof. (8)

5.3.2 State TWO elements of design applicable in the design of the chair's leg. (2)

5.4 State THREE characteristics of the Cape furniture style. (3)
[40]

TOTAL: 200÷2=100

END