

GAUTENG DEPARTMENT OF EDUCATION  
SENIOR CERTIFICATE EXAMINATIONWOODWORK SG  
(Second Paper: Theory)OCTOBER / NOVEMBER 2005  
OKTOBER / NOVEMBER 2005

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 Broad-leafed trees are usually associated with \_\_\_\_\_.
- A. softwoods
  - B. exotic timbers
  - C. hardwoods
  - D. indigenous timbers
- 1.2 Which **one** of the following timbers is **not** exotic to Africa?
- A. Imbuia
  - B. Oak
  - C. Tamboti
  - D. Beech
- 1.3 Exotic timbers to Africa which are used in furniture manufacture in South Africa:
- A. Oregon Pine, Imbuia, Pau Marfin, Oak
  - B. Beech, Kiaat, Iroko, Pau Marfin
  - C. Sapele Mahogany, Stinkwood, Yellowwood, Oak
  - D. Iroko, Sapele Mahogany, Imbuia, Kiaat

- 1.4 Which organisation is responsible for the grading of timber?
- A. SABS
  - B. HSRC
  - C. CSIR
  - D. KVV
- 1.5 Which one of the following is an unsafe operation?
- A. To help a fellow learner
  - B. To use wrong working techniques
  - C. To constantly ask the teacher's help
  - D. To tuck your tie into your shirt
- 1.6 Which one of the following statements about safety when using a wood chisel is **not** true?
- A. Keep both hands behind the cutting edge.
  - B. Hold the wood firmly in one hand.
  - C. Resharpener a blunt chisel before using.
  - D. If possible fix the wood firmly in the vice.
- 1.7 The \_\_\_\_\_ is used to clean shave a completed work before final sanding.
- A. trying plane
  - B. jack plane
  - C. router plane
  - D. smoothing plane
- 1.8 Shaping 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
- 1.9 The size of a rip 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
- 1.10 This drill bit can be used to drill holes in almost any type of material.
- A. Auger bit
  - B. Forstner bit
  - C. Expanding bit
  - D. Morse twist drill

- 1.11 Which of the following tools will be used to make a hole to start a small screw?
- A. A bradawl
  - B. A centre punch
  - C. A nail punch
  - D. A scriber
- 1.12 What will the result be if a screwdriver's tip is wider than the screw slot?
- A. It will break the screw head.
  - B. A good grip
  - C. It will damage the wood.
  - D. It will damage the screw slot.
- 1.13 Oil is used on an oilstone during the honing of tools to \_\_\_\_\_.
- A. prevent the stone from overheating
  - B. prevent the pores on the stone from becoming clogged
  - C. prevent the stone from becoming hollow
  - D. ease the honing process
- 1.14 The following aspect is **not** relevant when sawing wood in the bandsaw:
- A. Thickness of the wood
  - B. Hardness of the wood
  - C. Complexity of the cut
  - D. Colour of the wood
- 1.15 How is the size of the wood turning lathe determined?
- A. Length of the bed
  - B. Length of the tool rest
  - C. Maximum distance between the centres
  - D. Power of the electric motor
- 1.16 Which joint is used for corners of door frames with glass panels?
- A. Feather and groove joint
  - B. F-joint
  - C. Tongue and groove joint
  - D. Long and short shouldered mortice and tenon joint

- 1.17 In softwood the slope for dovetails is \_\_\_\_\_.
- A. 1:2
  - B. 1:4
  - C. 1:8
  - D. 1:10
- 1.18 Which one of the following is **not** a factor that influences the design of home furniture?
- A. Climatic conditions
  - B. Available material
  - C. Prevailing fashion
  - D. Craftsmanship
- 1.19 Which one of the following is **not** a characteristic of the Cape furniture style?
- A. Board products
  - B. Local woods
  - C. Clumsy and heavy
  - D. Solid wood
- 1.20 Discolouring of wood is caused by \_\_\_\_\_.
- A. beetles
  - B. termites
  - C. fungi
  - D. seasoning

(20)

**QUESTION 1B**

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, phrase or symbol from Column A, B or C that best describes the word or phrase listed from 1.21 to 1.30. Write only the question number and the correct answer (A, B or C).

		<b>A</b>	<b>B</b>	<b>C</b>
1.21	Indigenous conifers	Eliotti pine	Oregon pine	Real yellowwood
1.22	Rejected wood	XX	V 4	M 6
1.23	A defect	Open grain	A knot	Colour differences
1.24	Face side mark	∧	+	ƒ
1.25	A burr	Shavings	A thin, hairlike metal ridge on the edge of a chisel blade	A chisel handle that curls round
1.26	Not suitable for wood joints	Casein glue	Contact glue	PVA-glue
1.27	Ergonomics	The study of furniture styles	The study of furniture construction	The development of measurements according to the human body
1.28	Well-known designer of furniture	Baker	Sheraton	Ferrari
1.29	Toxicity of preservatives	Degree of poison	Quantity of agent penetrating the timber	Quantity of agent that remains in the timber
1.30	Staining	The process by which the colour of the wood can be changed	The process by which timber can be treated against insects	The process by 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** 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.

	<b>Distribution</b>	<b>Colour of heartwood</b>	<b>Odour</b>	<b>Texture</b>	<b>Contains</b>	<b>Working properties</b>
	1. Zambia 2. Knysna (SA) 3. Uganda 4. Britain 5. Mpumalanga 6. Brazil 7. Japan 8. USA 9. South America 10. Tanzania 11. Namibia	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	1. Cedar 2. Spicy 3. Resin 4. Sweet 5. Unpleasant	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. Bends with steam treatment
Beech		<b>D</b>				
Real Yellowwood	<b>A</b>					
Imbuia	<b>B</b>		<b>G</b>			
Iroko					<b>L</b>	
Japanese Oak						<b>N</b>
Kiaat		<b>E</b>		<b>J</b>		<b>O</b>
Oregon pine	<b>C</b>					<b>P</b>
Pau Marfin				<b>K</b>		
S.A. pine		<b>F</b>	<b>H</b>			
Sapele mahogany						
Stinkwood			<b>I</b>			
Tamboti					<b>M</b>	

(16)

**Table 2.1**

**2.2 Conversion of timber**

- 2.2.1 State FOUR reasons why logs should be sawn into boards as quickly as possible. (4)
- 2.2.2 Which method is mainly used for the conversion of SA pine? (1)
- 2.2.3 State THREE reasons why the above-mentioned method is used to convert SA pine. (3)
- 2.2.4 Name and sketch the method that is generally used to convert oak. (2)

**2.3 Defects in timber**

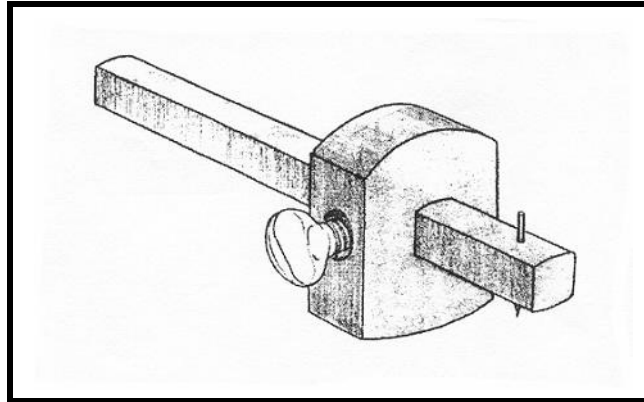
- 2.3.1 Ring shake is a defect that occurs in some growing tree trunks.
- (a) Make a neat sketch to illustrate ring shake. (1)
- (b) What is the cause of ring shake in growing tree trunks? (2)
- 2.3.2 Make a neat sketch to illustrate reaction wood that occurs in growing tree trunks. (2)
- 2.3.3 What is the cause of reaction wood? (1)
- 2.3.4 State TWO reasons why boards warp. (2)
- 2.3.5 Name and sketch TWO forms of warping that occur in converted boards. (4)

**2.4 Grading of timber**

- State TWO characteristics that must be taken into account when grading timber. (2)
- [40]**

**QUESTION 3**  
**HAND AND MACHINE TOOLS**

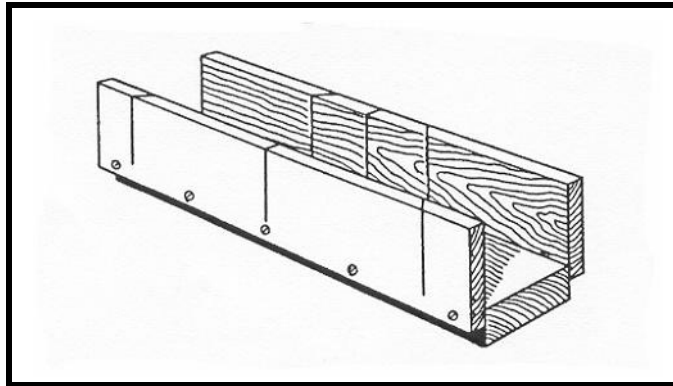
- 3.1 Measuring and marking tools are precision tools and should be handled with care. State THREE important facts concerning the care of these tools. (3)
- 3.2 **Figure 3.2** shows a single-pin marking gauge. Study the illustration and answer the questions that follow.

**Figure 3.2**

- 3.2.1 A board that measures 250 mm long x 75 mm wide and 25 mm thick must be worked down to a thickness of 20 mm. Describe briefly, by referring to the parts of the marking gauge, how you would set the gauge so that you can draw the thickness line on the board. (3)
- 3.2.2 Describe briefly how you will use the marking gauge to draw the thickness line on the board. (3)
- 3.3 Why is it not wise to check a board for squareness in a dark room? (2)
- 3.4 **Planing**
- 3.4.1 Briefly describe the TWO adjustments that must be made on a plane when delicate planing is done. (2)
- 3.4.2 What causes a plane to block and how can it be rectified? (2)



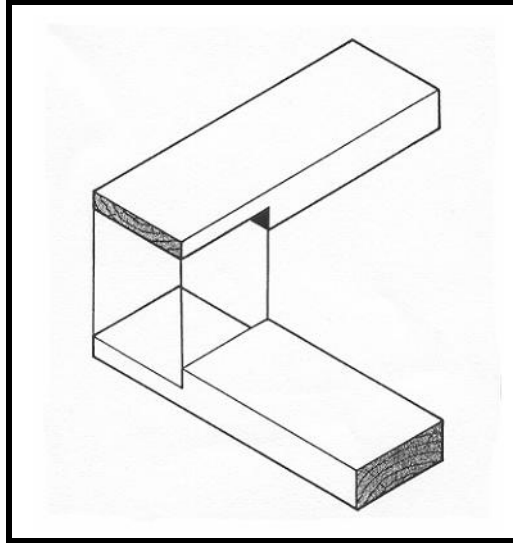
3.5 **Figure 3.5** shows a handy aid that can be used when sawing is being done.



**Figure 3.5**

- 3.5.1 What is this aid called? (1)
- 3.5.2 Which saw will be used with this aid? (1)
- 3.5.3 State the TWO functions of this aid. (2)
- 3.5.4 Give an example of where this aid can be used. (1)

3.6 **Figure 3.6** shows a corner half-lapped joint.



**Figure 3.6**

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

- 3.6.1 Preparation (2)
- 3.6.2 Marking out of the joint (4)
- 3.6.3 Removal of excess material (4)

Note: Refer to the hand tools you will use.

### 3.7 **The drill press**

The speed at which the drill press works differs depending on the type of work that is done. At what speed will you do the following jobs (fast, medium or slow)?

- 3.7.1 Drilling 12 mm mortice holes, using the morticing attachment (1)
- 3.7.2 Sanding edges, using a drum sander (1)
- 3.7.3 Drilling a 5 mm hole, using a morse drill bit (1)

### 3.8 **The belt and disk sander**

How will you adjust the table of the disk sander to a square position? (3)

**3.9 The bandsaw**

It is of the utmost importance to keep the blade in position when making accurate cuts. What role do the following parts play in this regard?

3.9.1 The ball bearing blade support (2)

3.9.2 The blade guides (2)

**3.10 The circular saw**

Show by means of a sketch a typical push stick that is used when narrow strips are sawn on the circular saw. (2)

**3.11 The wood turning lathe**

Briefly describe how you will ensure that four legs for a table are identically turned. (2)

**3.12 Portable power tools**

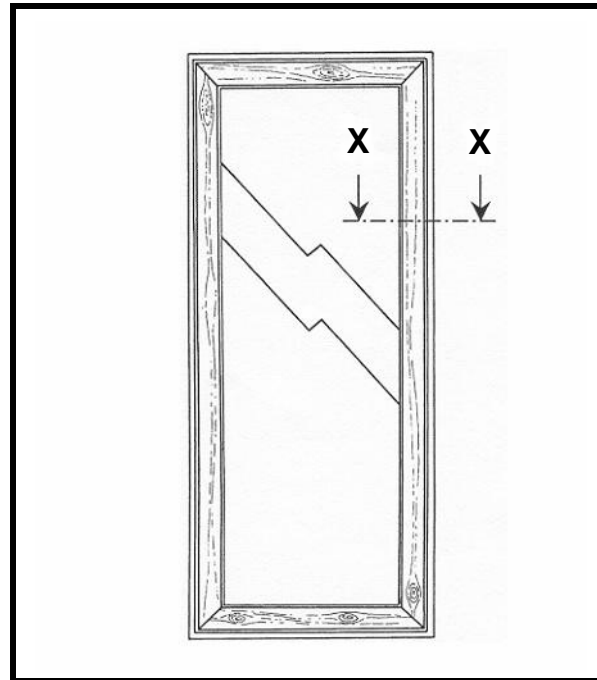
State THREE safety measures that are applicable to electricity when using portable power tools. (6)

**[50]**

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

4.1 **Frame construction**

**Figure 4.1** shows the front view of a mirror frame.



**Figure 4.1**

4.1.1 Draw freehand section **XX** as shown in **Figure 4.1**.

The following details must be shown.

- Edge profile
- Rebate for the mirror
- Mirror (glass)
- Fixing of the mirror (5)

4.1.2 Which joint has been used for the corner of the mirror frame? (1)

4.1.3 How will you strengthen the joint? (1)

4.1.4 Which other joint can be used here? (1)

## 4.2 Drawer construction

Figure 4.2 shows a drawer that is made out of solid wood.

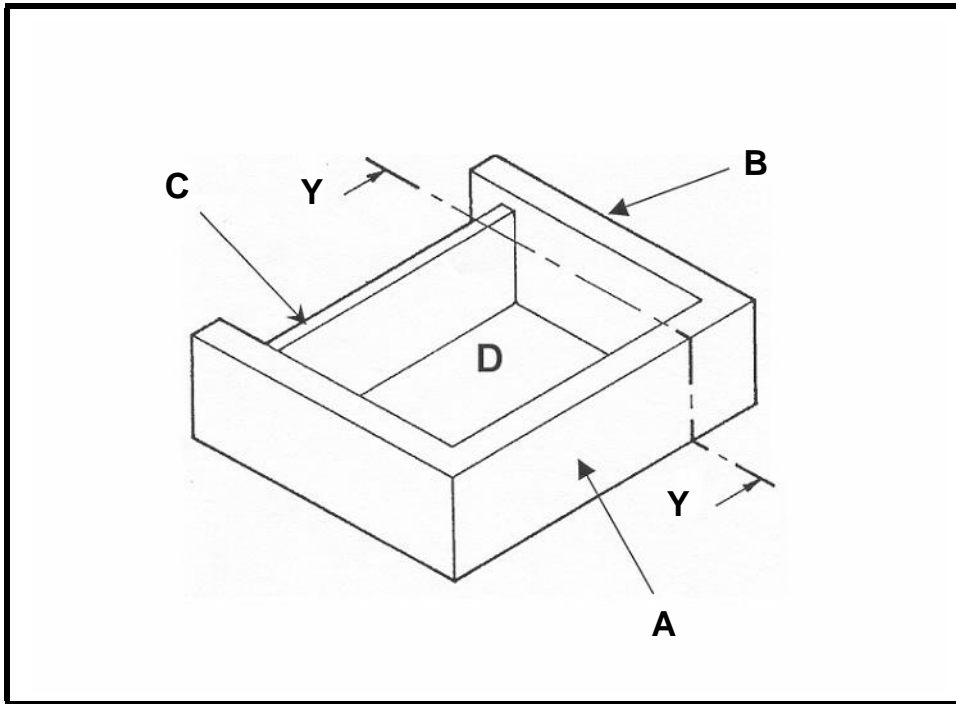
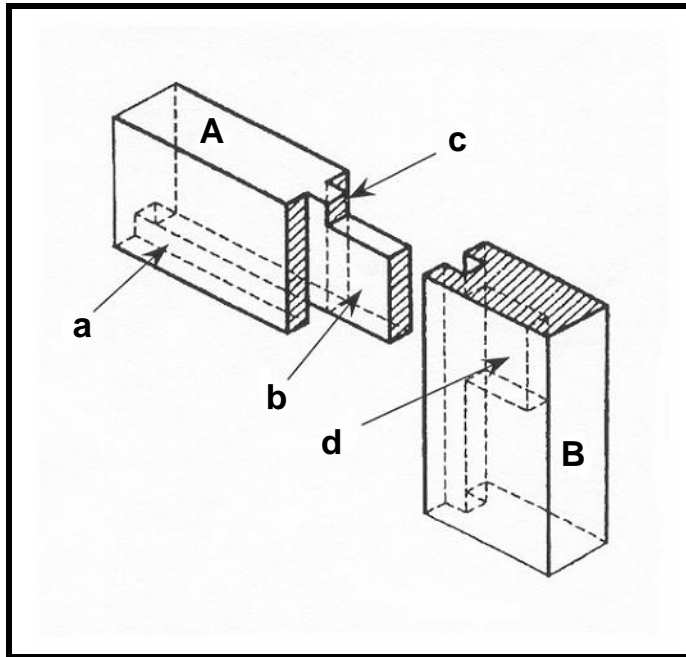


Figure 4.2

- 4.2.1 Make a neat sectional sketch of the drawer on cutting line Y – Y. (8)
- 4.2.2 Which joint will you use to join front A to side B? (1)
- 4.2.3 Which joint will you use to join side B to back C? (1)
- 4.2.4 How will you install the drawer bottom D so that it could be easily replaced? (2)
- 4.3 Describe, step by step, how you will prepare four boards to make a tabletop by using rubbed glued joints. Make use of three clamps to clamp the boards. Give the following:
- 4.3.1 Preparation of edges (2)
- 4.3.2 Sketch of the arrangement of the boards showing the end grain (2)
- 4.3.3 The glueing process (2)
- 4.3.4 Type of clamp used and the placing thereof (3)
- 4.3.5 TWO other widening joints that could be used (2)

4.4 **Figure 4.4** shows a joint that is developed for a specific purpose. Study the sketch and answer the questions that follow.



**Figure 4.4**

- 4.4.1 What is the joint in **Figure 4.4** called? (1)
- 4.4.2 Where will this joint be used? (1)
- 4.4.3 What is the purpose of groove **a**? (1)
- 4.4.4 What is the purpose of haunch **c**? (1)
- 4.4.5 What will be the thickness of **b** if **A** is 21 mm thick? (1)
- 4.4.6 What will be the length of **b** if **B** is 60 mm wide? (1)
- 4.4.7 Is the depth of **d** the same as the length of **b**? (1)
- 4.4.8 Substantiate your answer given to question 4.4.7. (2)
- [40]**

**QUESTION 5**  
**PRESERVATION, FINISHING AND DESIGN**

**5.1 Preservation of timber**

- 5.1.1 The durability of timber is affected by certain factors.
- (a) Name THREE biological factors that attack timber. (3)
- (b) Name THREE physical factors that attack timber. (3)
- 5.1.2 To protect timber against the above-mentioned factors it should be treated with preservatives. Name ONE such preservative. (1)
- 5.1.3 A good preservative should meet certain requirements. Name FOUR such requirements. (4)
- 5.1.4 The application of preservatives under pressure is the most efficient method to force the preservative into the cells of timber. State THREE advantages of high pressure processes over other processes. (3)

**5.2 Finishing of wood**

- 5.2.1 How will you finish timber with an open grain to a smooth surface? (2)
- 5.2.2 Wood containing resin is inclined to block sanding paper. Which other alternative can be used to work the wood to a smooth finish? (1)
- 5.2.3 What will you do to hide the heads of panel pins? (2)
- 5.2.4 State TWO advantages that varnish has over wax polish as a protective coating. (2)
- 5.2.5 State TWO disadvantages that an oil finish has as a protective coating. (2)

## 5.3 Design

Figure 5.3 shows the outer lines of a cabinet.

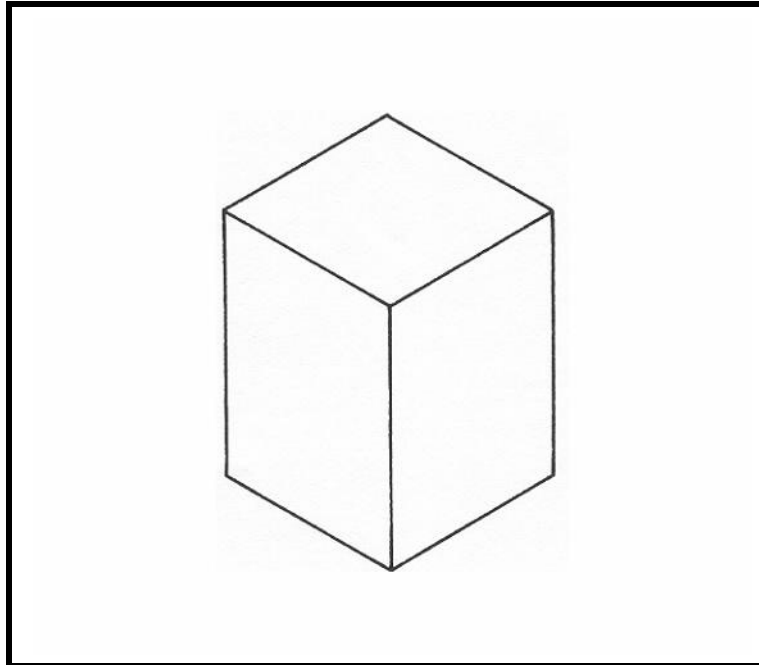


Figure 5.3

- 5.3.1 Use the proportions as proposed in **Figure 5.3** and design a bedside cabinet with the following specifications in mind. Sketch freehand a front view and a left view.
- Specifications:**
- (a) One drawer that spans the length of the cabinet
  - (b) A solid framed door
  - (c) A top with an overhang to the front and sides
  - (d) The cabinet must be lifted from the floor. (8)
- 5.3.2 State FOUR principles of design to which the above-mentioned cabinet should measure up. (4)
- 5.4 Technology and the ever-increasing demand for furniture play an important role in the design and manufacture of contemporary furniture. State FIVE characteristics of contemporary furniture. (5)

[40]

TOTAL: 200÷2=100

END