



STUDENT NUMBER

CENTRE NUMBER

HIGHER SCHOOL CERTIFICATE EXAMINATION

2000

INDUSTRIAL TECHNOLOGY

2 UNIT

SECTION II

FURNITURE AND TIMBER PRODUCTS INDUSTRIES

*Total time allowed for Sections I and II—One hour and a half
(Plus 5 minutes reading time)*

DIRECTIONS TO CANDIDATES

- Write your Student Number and Centre Number at the top right-hand corner of this page.
- Where appropriate, show all working for solutions neatly and clearly.
- You may use Board-approved drawing instruments and calculators.

Section II—Furniture and Timber (15 marks)

- Question 4 is COMPULSORY.
- Attempt TWO questions from Questions 5, 6, and 7.
- Answer the questions in the spaces provided in this paper.

MARKER'S USE ONLY

Question				
4				
5				
6				
7				

SECTION II—FURNITURE AND TIMBER PRODUCTS INDUSTRIES

(15 Marks)

QUESTION 4 This question is COMPULSORY. (5 marks)

A furniture manufacturing company has designed a prototype for a student desk. Figure 1 shows a pictorial drawing of the student desk. The desk top is removed for clarity.

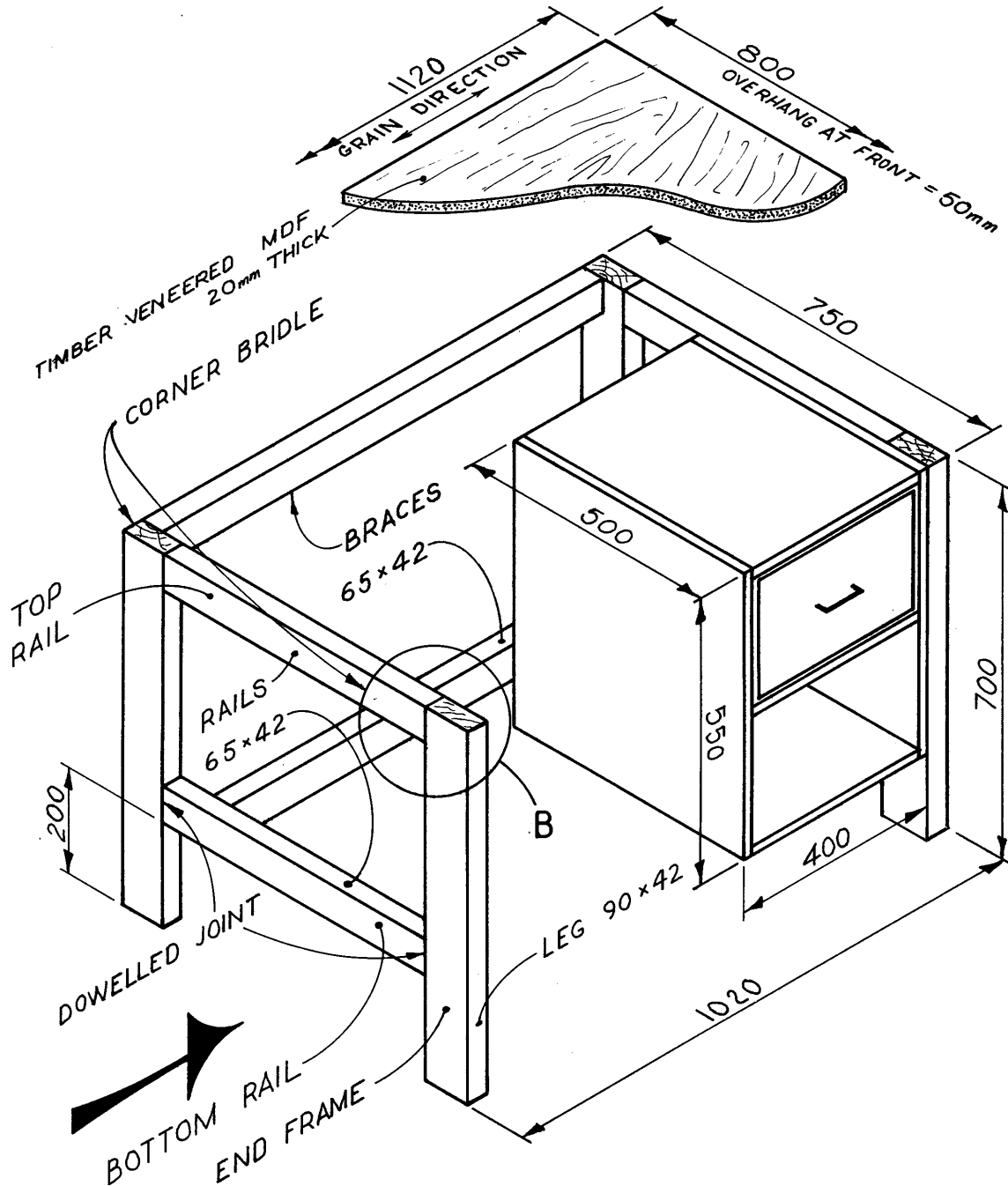


FIG. 1. STUDENT DESK

QUESTION 4 (Continued)

- (a) (i) Accurately sketch, in proportion, a side view of the student desk, with desk top attached, when viewed in the direction of the arrow. Hidden detail should be omitted. A starting position for the base of the rear leg is given below.

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- (ii) The joint at **B** in Figure 1, is a corner bridle joint. Complete the drawing in Figure 2 to show the marking out for construction of the corner bridle joint. Clearly indicate the waste in the joint marking out.

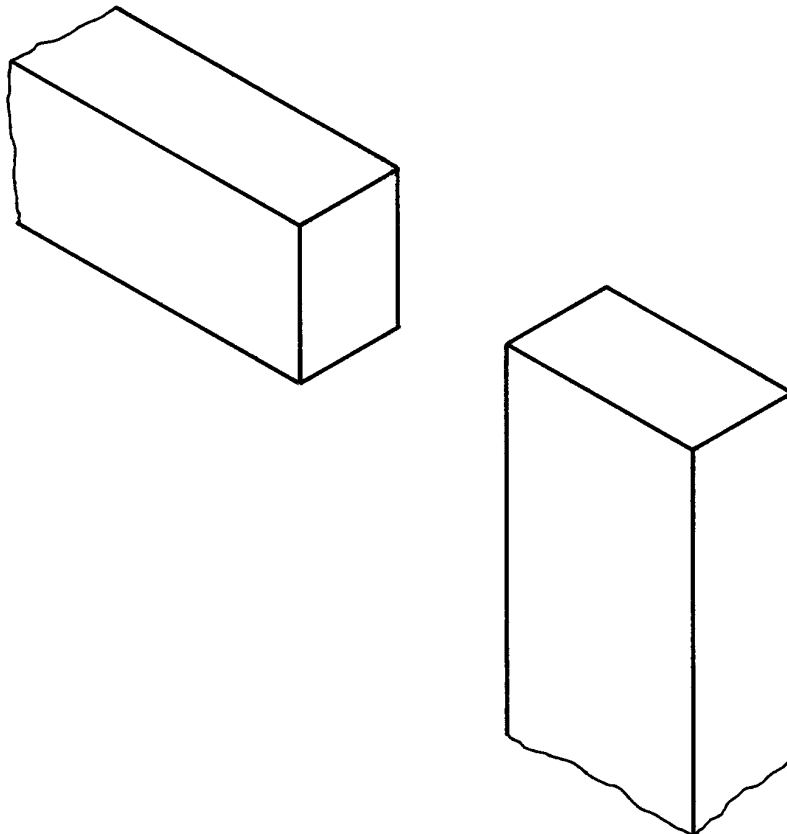


FIG. 2

Question 4 continues on page 4

QUESTION 4 (Continued)

- (iii) Describe a suitable method for removing the waste, using machine tools from the slot of the corner bridle joint.

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- (iv) Name TWO alternative timber corner joints (apart from a dowelled joint) that could be used at **B** in Figure 1, in place of the corner bridle joint.

1
2

QUESTION 4 (Continued)

(b) The Production Manager of the company has received an order for fifty (50) student desks.

(i) Calculate the timber requirements for the following components for an order of fifty (50) desks. Ignore waste allowance.

	<i>No. per desk</i>	<i>Timber size</i> (width × thickness)	<i>Requirements for order</i>
Legs	4	90 × 42	= lineal metres
Braces	2	65 × 42	= lineal metres
Top rails	2	65 × 42	= lineal metres
Bottom rails	2	65 × 42	= lineal metres

(ii) The desk top is manufactured from timber-veneered medium density fibreboard (MDF), priced at \$85 per sheet including GST. The sheet size is 2400 mm × 1200 mm.

Calculate the cost of supplying the desk top material for the fifty (50) desks.

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Attempt TWO questions from Questions 5, 6, and 7.

QUESTION 5 (5 marks)

- (a) The student desk shown in Figure 1 has been designed to be assembled and disassembled on-site. The two end frames are joined together by two braces.

Name TWO types of knock-down fittings that could be used to join the braces to the end frames.

Fitting 1

Fitting 2

- (b) The top of the student desk is manufactured from timber-veneered medium density fibreboard (MDF). Provide THREE reasons why this material would be used in preference to solid timber.

Reason 1

Reason 2

Reason 3

- (c) In the space below, make a labelled sketch to show a suitable method for securing the desk top to the assembled desk frame. The chosen method must allow for easy assembly and disassembly of the desk.

QUESTION 5 (Continued)

- (d) The raw edge of the timber-veneered MDF desk top requires an appropriate solid timber edge treatment. In the choice of edge treatment, safety, aesthetics and method of attachment to the desk top should be considered.

Complete the sketches in Figure 3 and Figure 4 to show TWO appropriate designs for edge treatment of the desktop, showing how you addressed the considerations above.

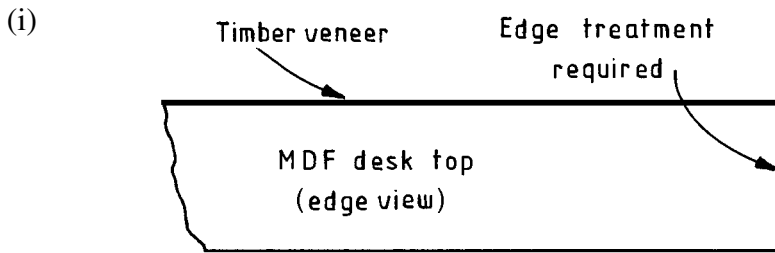


FIG. 3

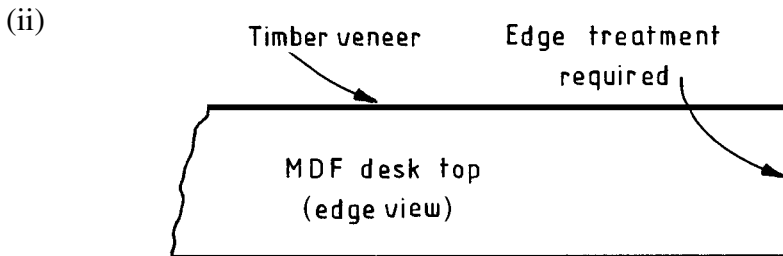


FIG. 4

- (e) (i) The timber used for the legs of the desk is 90×42 DAR. Define the term DAR.

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- (ii) Solid timber is sold in standard metric lengths in timber yards. Explain what is meant by the term 'standard lengths'.

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QUESTION 5 (Continued)

- (f) A customer requires a desk top constructed from solid timber, in preference to timber-veneered MDF. Produce a labelled sketch to show an appropriate industrial method (other than a glued butt joint) of joining the solid timber boards edge to edge.

Attempt TWO questions from Questions 5, 6, and 7.

QUESTION 6 (5 marks)

The selection of timber for the frame of the student desk is an important consideration.

(a) (i) Name the defects in the solid timber boards shown in Figure 5.



1



2



3



4

FIG. 5

(ii) Give TWO reasons why timber boards may have defects as shown in Figure 5.

Reason 1

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Reason 2

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(iii) The timber chosen for the frame of the student desk has been kiln-dried to bring it to its equilibrium moisture content.

Explain the terms *kiln-dried* and *equilibrium moisture content*.

Kiln-dried

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Equilibrium moisture content

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QUESTION 6 (Continued)

- (b) Mountain Ash is an example of a native Australian hardwood. Radiata Pine is an example of an exotic softwood grown in Australia. Complete the table below to show the differences between hardwoods and softwoods.

Hardwood	Softwood
	Gymnosperms
Seeds in fruit	
Broad leaves	
	Tracheid structure

- (c) (i) State TWO advantages of growing softwood trees in plantations.

Advantage 1

Advantage 2

- (ii) Plantation timbers such as Radiata Pine are grown on a rotational basis. Name THREE important phases in the growth of trees in a Radiata Pine plantation.

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- (iii) Radiata Pine is treated with a chemical to make it suitable for outdoor use.

- 1 Name this chemical.

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- 2 Explain the treatment process.

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QUESTION 6 (Continued)

- (d) Name and describe an appropriate conversion method for producing high quality solid timber from a log.

Conversion method

Description

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Please turn over

Attempt TWO questions from Questions 5, 6, and 7.

QUESTION 7 (5 marks)

(a) The student desk will be finished with the application of a clear solvent-based lacquer. Before being finished, all surfaces of the desk must be fully prepared.

(i) Coated abrasive papers are used in the finishing process.

Name THREE types of abrasives used for coating the abrasive papers.

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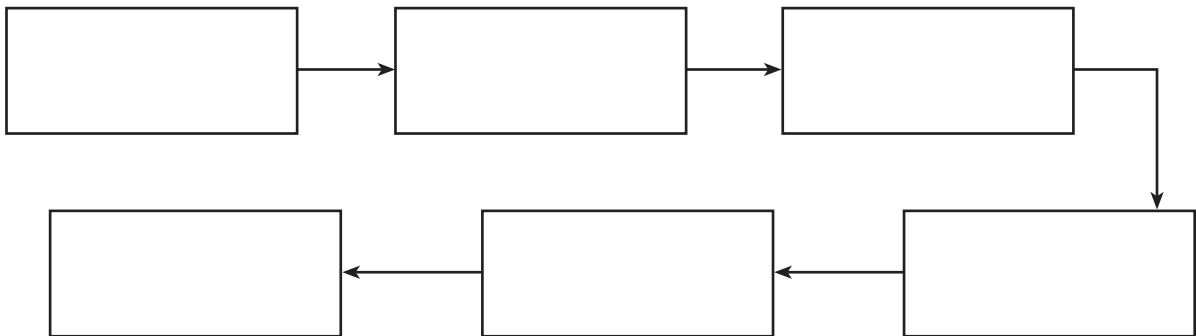
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(ii) Explain the grading '80', which is found on the back of some coated abrasive papers.

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(iii) Using the phrases listed below, complete a flowchart to show the correct sequence of finishing operations that should be used for the desk.

- Apply sanding sealer
- Stop holes and cracks
- Apply finishing coats
- Raise the grain
- Prepare surfaces with abrasive paper
- Re-sand surfaces



(iv) List TWO properties of sanding sealers that make them effective as initial coats.

1

2

QUESTION 7 (Continued)

- (v) If the student desk was mass-produced, it would be finished by a blanket coating process. Explain the term *blanket coating*.

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- (vi) Give TWO reasons why a clear finish would be chosen for the student desk.

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- (b) The top of the student desk is made from timber-veneered medium density fibreboard.

- (i) Describe TWO methods of producing timber veneers.

1
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- (ii) Name the adhesive used in industry for attaching veneers to the medium density fibreboard core.

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Question 7 continues on page 14

QUESTION 7 (Continued)

- (c) (i) Complete Figure 6 by sketching a side view of the student desk in position relative to the seated student. Show the position of the student's arm in your sketch.

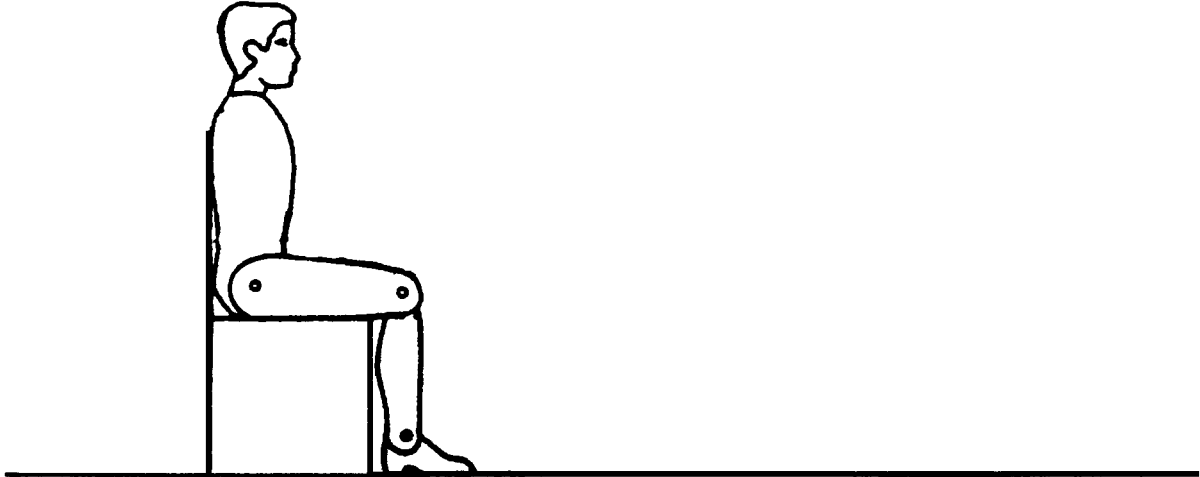


FIG. 6

- (ii) Name and describe TWO considerations of size that would have been taken into account by the designer of the student desk.

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