

**B O A R D O F S T U D I E S**  
NEW SOUTH WALES

**2010**

**HIGHER SCHOOL CERTIFICATE  
SPECIMEN EXAMINATION**

# Industrial Technology

## Timber Products and Furniture Technologies

### General Instructions

- Reading time – 5 minutes
- Working time – 1 hour and 30 minutes
- Write using black or blue pen
- Board-approved calculators may be used
- Write your Centre Number and Student Number at the top of page 6

**Total marks – 40**

**Section I** Pages 2–5

**10 marks**

- Attempt Questions 1–10
- Allow about 20 minutes for this section

**Section II** Pages 6–9

**15 marks**

- Attempt Questions 11–13
- Allow about 35 minutes for this section

**Section III** Page 10

**15 marks**

- Attempt Question 14
- Allow about 35 minutes for this section

## Section I

10 marks

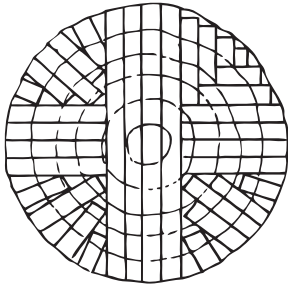
Attempt Questions 1–10

Allow about 20 minutes for this section

Use the multiple-choice answer sheet for Questions 1–10.

---

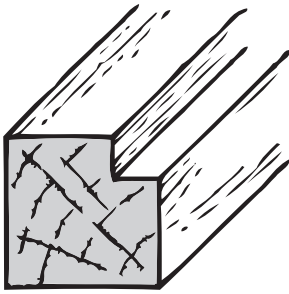
- 1 A method used to convert logs into boards is illustrated in the diagram.



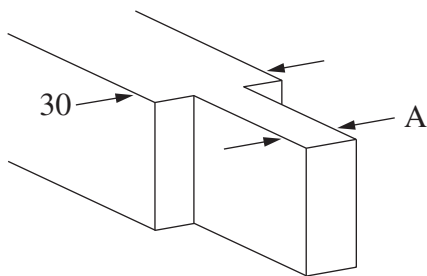
What is the name for this method?

- (A) Back sawing
  - (B) Live sawing
  - (C) Quarter sawing
  - (D) Through sawing
- 2 Which of the following manufactured boards is NOT made from pine trees?
- (A) Softboard
  - (B) Hardboard
  - (C) Particle board
  - (D) Medium density fibreboard
- 3 What is polyvinyl acetate?
- (A) A wood adhesive
  - (B) A type of timber finish
  - (C) A polymer used to make tool handles
  - (D) A clear plastic that can be used instead of glass

- 4 Which plane is most appropriate to use to create the feature illustrated in the diagram?



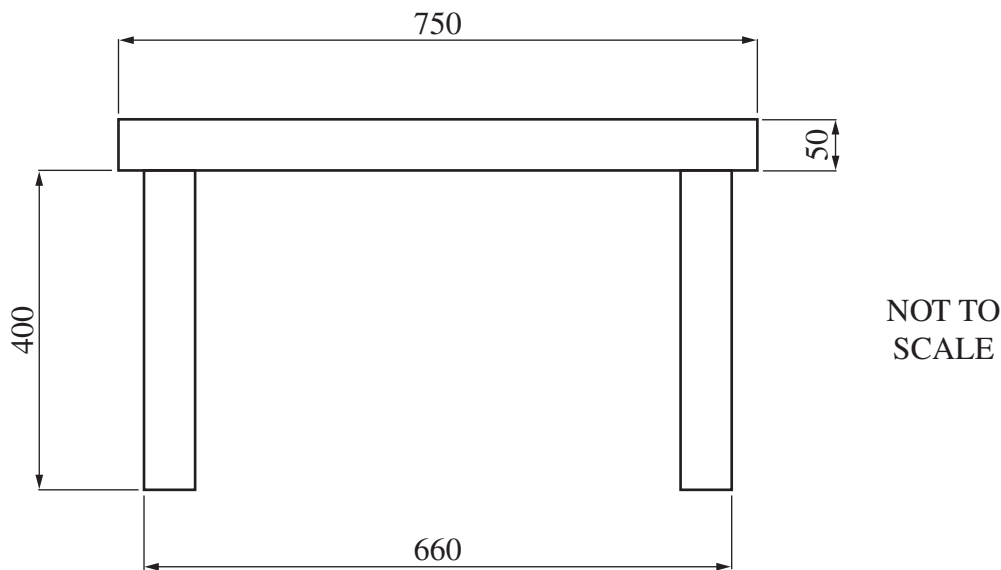
- (A) Block plane
  - (B) Rebate plane
  - (C) Router plane
  - (D) Scraper plane
- 5 A piece of timber was prepared for a common mortise and tenon joint, as shown.



NOT TO SCALE

- What should be the dimension at A?
- (A) 6 mm
  - (B) 10 mm
  - (C) 12 mm
  - (D) 30 mm
- 6 What is the name of the process used to turn a table leg on a woodturning lathe?
- (A) Faceplate turning
  - (B) Laminated turning
  - (C) Screwchuck turning
  - (D) Between centres turning

- 7 The drawing shows a side view of a table, with dimensions as shown.



- What is the overall height of the table?
- (A) 400 mm
  - (B) 450 mm
  - (C) 660 mm
  - (D) 750 mm
- 8 What industrial machine would be the most appropriate to use to cut a mortise?
- (A) Biscuit jointer
  - (B) Mortise gauge
  - (C) Mortising chisel
  - (D) Hollow chisel mortiser
- 9 What is the most appropriate order in which to glue up a timber frame?
- (A) Tighten cramps, remove glue, leave to dry
  - (B) Tighten cramps, check for square, remove glue
  - (C) Check for square, tighten cramps, remove glue
  - (D) Remove glue, check for square, tighten cramps

- 10 The plywood parts shown in the table are needed for a project.

<i>Part</i>	<i>Length (mm)</i>	<i>Width (mm)</i>	<i>Thickness (mm)</i>	<i>Quantity</i>	<i>Cost</i>
Top	500	500	16	1	
Sides	700	500	16	2	
Base	500	500	16	1	

16 mm plywood costs \$25.00 per square metre.

What is the total cost of these plywood parts?

- (A) \$21.25
- (B) \$25.00
- (C) \$30.00
- (D) \$212.50

**Industrial Technology  
Timber Products and Furniture  
Technologies**

--	--	--	--	--

Centre Number

--	--	--	--	--	--	--	--	--

Student Number

**Section II**

**15 marks**

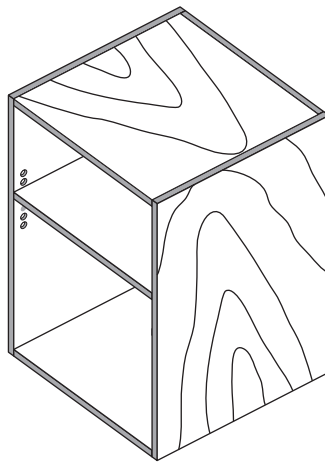
**Attempt Questions 11–13**

**Allow about 35 minutes for this section**

Answer the questions in the spaces provided. These spaces provide guidance for the expected length of response.

---

**Question 11 (8 marks)**



- (a) Select and justify the most appropriate manufactured board to use to make the cabinet. **3**

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

**Question 11 continues on page 7**

Question 11 (continued)

(b) Describe the environmental issues related to the manufacture, use and disposal of the manufactured board selected in part (a). **3**

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

(c) Name and describe, with the aid of sketches, a means of attaching the top of the cabinet to the sides. **2**

.....

.....

.....

.....

.....

.....

.....

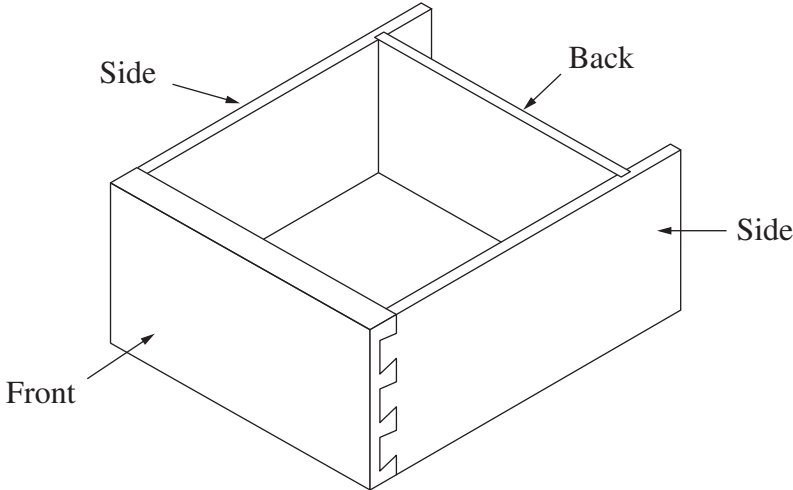
.....

**End of Question 11**

**Question 12** (3 marks)

Describe a suitable industrial manufacturing process for the drawer shown. Include in your answer all checks to ensure that the finished drawer is flat and square.

**3**



.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....



# Industrial Technology Timber Products and Furniture Technologies

## Section III

15 marks

Attempt Question 14

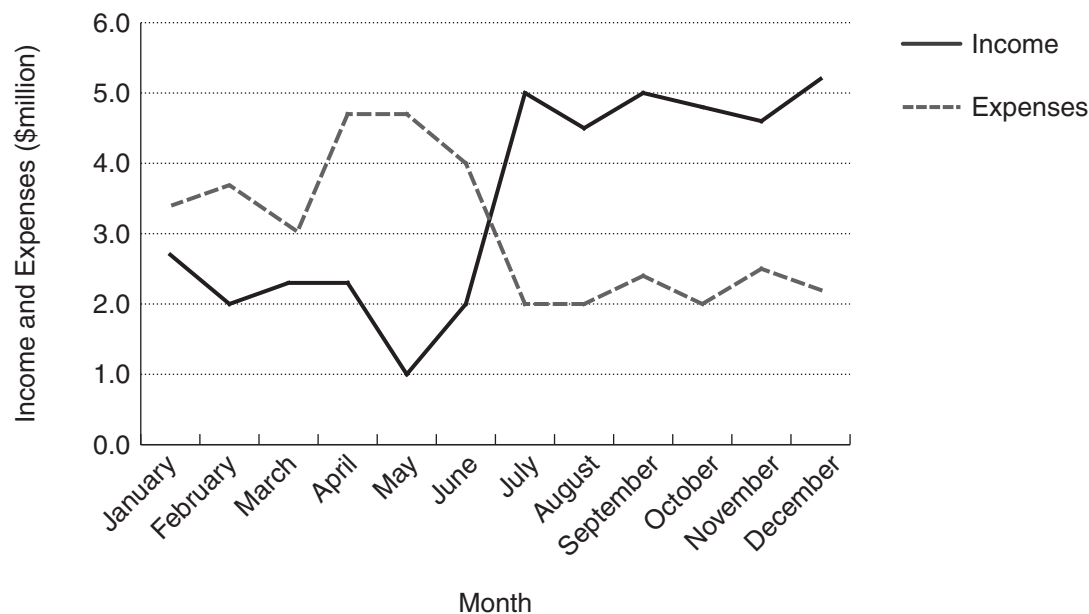
Allow about 35 minutes for this section

Answer the question in a writing booklet. Extra writing booklets are available.

### Question 14 (15 marks)

In response to advances in technology, a company makes changes to its production techniques.

The following graph is from the company's business report for the past calendar year.



- (a) Analyse the graph above to show how the changes to production techniques may have been responsible for the fluctuations in income and expenses. **5**
- (b) Discuss the issues that the management of the company needs to consider before the introduction of new technology. **10**

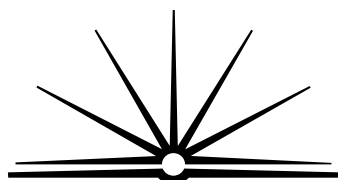
**End of paper**

# Industrial Technology

## Timber Products and Furniture Technologies

### 2010 HSC Specimen Examination Mapping Grid

Question	Marks	Content	Syllabus Outcomes	Targeted performance bands
<b>Section I</b>				
1	1	Materials – timber recovery and conversion	H1.2, H4.3	2–3
2	1	Materials – manufactured boards	H1.2, H4.3	2–3
3	1	Materials – adhesives	H1.2, H4.3	2–3
4	1	Processes, tools and machinery – carcass joints	H1.2, H4.3	3–4
5	1	Processes, tools and machinery – framing joints	H1.2, H3.2	3–4
6	1	Processes, tools and machinery – construction techniques	H1.2, H4.3	3–4
7	1	Processes, tools and machinery – planning	H1.2, H3.1	3–4
8	1	Processes, tools and machinery – tools and machinery used in industry	H1.2, H4.3, H6.1	3–4
9	1	Processes, tools and machinery – assembly of components	H1.2, H4.3, H6.2	4–5
10	1	Processes, tools and machinery – planning	H1.2, H3.2, H5.2	5–6
<b>Section II</b>				
11 (a)	3	Materials – manufactured boards	H1.2, H7.1, H7.2	2–4
11 (b)	3	Materials – manufactured boards	H1.2, H2.1, H6.2	3–6
11 (c)	2	Processes, tools and machinery – construction techniques	H1.2, H3.1, H6.1, H6.2	2–4
12	3	Processes, tools and machinery – manufacturing individual components	H1.2, H2.1, H4.3, H6.1	3–6
13	4	Processes, tools and machinery – tools and machinery used in industry	H1.2, H2.1, H4.3, H6.1, H6.2	3–6
<b>Section III</b>				
14 (a)	5	Industry Study – structural considerations	H1.1, H1.2, H3.1, H7.2	2–6
14 (b)	10	Industry Study – structural considerations, technical considerations	H1.1, H7.2	2–6



**B O A R D O F S T U D I E S**  
NEW SOUTH WALES

## **2010 HSC Industrial Technology – Timber Products and Furniture Technologies Specimen Examination**

### **Sample Marking Guidelines**

#### **Section I**

<b>Question</b>	<b>Correct Answer</b>
1	C
2	A
3	A
4	B
5	B
6	D
7	B
8	D
9	B
10	C

## Section II

### Question 12

#### MARKING GUIDELINES

Criteria	Marks
• Provides characteristics and features of a suitable process to manufacture the drawer, including all quality checks	3
• Provides characteristics and features of some steps in the manufacture of the drawer, including some quality checks	2
• Lists some steps in the manufacture of the drawer or quality checks	1

#### *Sample answer:*

- Cut sides and back to length and width
- Fit drawer front
- Using dovetail machine cut lapped dovetails on drawer front and drawer sides
- Using spindle machine, overhead router or circular saw, cut groove in sides for drawer bottom
- Cut drawer bottom to size
- Glue drawer together, check for square by measuring diagonals and for flatness using winding strips
- Use industrial gluing jig
- Check final measurements

## Section III

### Question 14 (a)

#### MARKING GUIDELINES

Criteria	Marks
<ul style="list-style-type: none"> <li>Provides a clear explanation (ie linking cause and effect) of the fluctuations in both income and expenses in terms of plausible causes stemming from the introduction of new production techniques and technologies</li> <li>Uses terminology appropriate to an industrial technology setting</li> <li>Communicates in a logical and coherent response</li> </ul>	5
<ul style="list-style-type: none"> <li>Provides an explanation (ie some linking of cause and effect) of the fluctuations in either income and expenses in terms of plausible causes stemming from the introduction of new production techniques and technologies</li> <li>Uses some terminology appropriate to an industrial technology setting</li> <li>Communicates in a clear fashion</li> </ul>	4
<ul style="list-style-type: none"> <li>Describes some aspects of the graph and links to features related to the introduction of new production techniques and technologies</li> <li>Uses some appropriate terminology</li> </ul>	3
<ul style="list-style-type: none"> <li>Provides several relevant features of the expenses and income graphs, without linking them to changes in production techniques</li> </ul> OR <ul style="list-style-type: none"> <li>Plausibly links one feature of the graph (eg spike in expenses) to the changes in production techniques and/or technologies</li> </ul>	2
<ul style="list-style-type: none"> <li>Lists one feature of the graph, eg expenses went up in March/April</li> </ul>	1

#### *Sample answer:*

From March to May expenses have increased due to the cost of upgrades to equipment/introduction of new technologies. The expense increases appear to be a once only event, signifying some initial expense associated with the changes to production techniques and new technologies introduced, and may have been a combination of hardware and initial setup costs eg installation, and also 'soft' costs such as training courses for new staff.

After May expenses reduce until July when they are lower than before production changes, possibly due to more efficient techniques.

Income reduced from April to May possibly due to reduced production/downtime/training of staff, after which income increases to a maximum in July, after which it is relatively stable.

The graph indicates that the changes to production techniques have been successful due to increased income while expenses have reduced slightly.

**Question 14 (b)****MARKING GUIDELINES**

<b>Criteria</b>	<b>Marks</b>
<ul style="list-style-type: none"><li>Clearly identifies a number of relevant issues that management should consider when introducing new technologies</li><li>Discusses, in a logical and coherent response, the positive and negative aspects of each of the issues identified, in relation to the company introducing new technologies, eg cost: negative aspect may be large initial outlays, positive aspect may be ongoing efficiencies that reduce long term costs</li></ul>	9–10
<ul style="list-style-type: none"><li>Identifies several appropriate issues that management should consider when introducing new technologies</li><li>Includes, with reasonable logic and structure, some discussion of the positive and negative aspects of each of the issues identified</li></ul>	7–8
<ul style="list-style-type: none"><li>Identifies one or two issues that management should consider when introducing new technologies</li><li>Includes some discussion of the positive and negative aspects of each of the issues identified, which may be linked to the introduction of new technologies</li></ul>	5–6
<ul style="list-style-type: none"><li>Lists one or two relevant issues, eg training</li><li>Includes some description of these issues and attempts to link these to the introduction of new technologies</li></ul>	3–4
<ul style="list-style-type: none"><li>Lists one or two relevant issues, eg training</li></ul>	1–2

***Answers may include:***

- Training of staff
- Cost
- Equity
- Needs to be viable
- OHS
- Future directions of company
- Target market/demographic
- Legislation – EPA, local council
- Environmental - EIS