

C A R I B B E A N E X A M I N A T I O N S C O U N C I L

**REPORT ON CANDIDATES' WORK IN THE
CARIBBEAN SECONDARY EDUCATION CERTIFICATE® EXAMINATION**

MAY/JUNE 2014

**BUILDING TECHNOLOGY
OPTION I – WOODS
TECHNICAL PROFICIENCY**

GENERAL COMMENTS

The number of candidates who wrote the examination was 2695 and approximately 77 per cent of them earned Grades I–III. Candidates did quite well on the practical project of the School-Based Assessment (SBA) but some demonstrated weakness in the written project. Competencies requiring focused attention are Knowledge and Application, which are tested on Paper 01 (Multiple Choice) and Paper 02 (Essay/Structured Response/Problem Solving).

DETAILED COMMENTS

Paper 01 — Multiple Choice

This paper consisted of 60 multiple choice items. Candidates' performance on this paper declined compared with that of 2013. The mean score was 30.7 compared with 33.7 for 2013. The highest score attained by a candidate was 55 compared with 56 for 2013.

Paper 02 — Structured Response Essay Questions

This is a structured response paper with three sections: A, B, and C.

Section A This section has one compulsory question based on Module C 7, Drawing and Design: Introduction to Drawing. This question is worth 40 marks.

Section B This section comprises five questions based on Modules C2.2, C3, C5, C6.1, C6.2 – Cutting and Shaving Hand tools, C3 – Machine Operations, C5 – Finishing, C6.1 Materials and C6.2 – Ironmongery. Candidates were required to attempt three questions from this section.

Section C This section consisted of three questions based on Modules C4 – Upholstery, 6.3 – Basic Cabinet Making, and C6.4 – Household Furniture. Candidates were required to answer only one question from this section.

The mean score on this paper was 46.5 compared with 46.6 in 2013. The highest score attained on this paper was 107 compared with 111 for 2013.

Section A

Question 1

This was a compulsory question based on Module C7 – Drawing and Design. It was designed to test candidates' knowledge and application of drawing and design skills for the production of ruler-assisted sketches of orthographic views. It also required the analysis, design and/or selection of suitable materials and joints for furniture construction. Candidates were presented with a pictorial drawing of a combined desk and bookcase. The labelled parts of the combined desk and bookcase were the top rail, desktop and bookshelf, with different joints labelled as 'C', 'D', 'E' and 'F'. The views were labelled as 'A' and 'B' and the shelf compartments were labelled as 'X' and 'Y', as shown in Figure 1. This question was worth 40 marks.

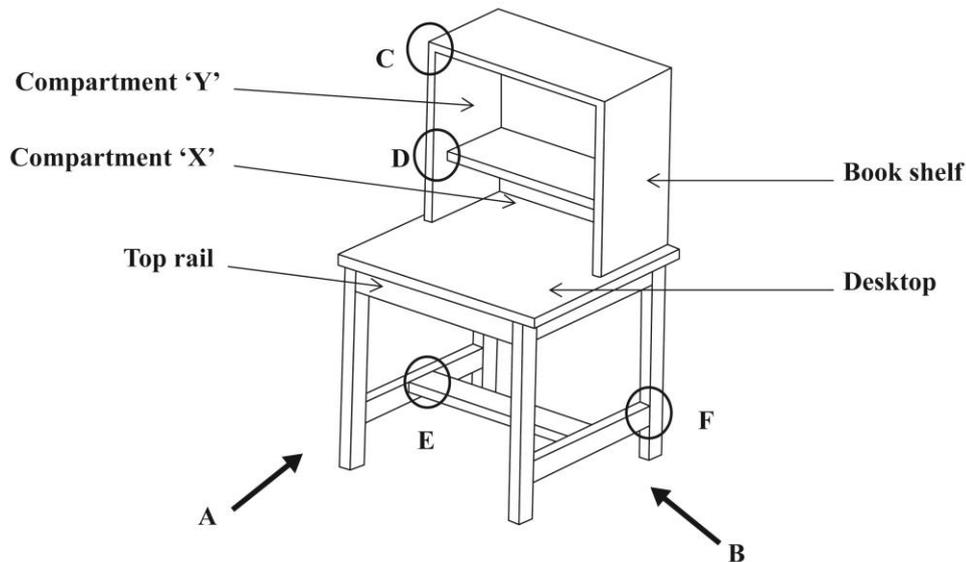


Figure 1. Sketch of combined desk and bookcase

Part (a) required candidates to use a neat, proportional, ruler-assisted sketch to produce the front elevation and an end elevation of the combined desk and bookcase. The specific requirements for this drawing was for candidates to redesign the lower compartment by dividing it to store compact discs and newspapers and the top rail to receive two small drawers for storing pens, pencils and other small items. The candidates were also required to identify the views by name and to name three types of lines used for detailed working drawings. This question was designed to test the application of skills in drawing and design.

A total of 96 per cent of the candidates attempted this compulsory question. Candidates' performance on this part of the question was much improved in comparison to similar questions of previous years. Those who were well prepared demonstrated good drawing and interpretation skills. However, candidates who were not fully exposed to design and drawing techniques encountered some level of difficulty to correctly produce the required pictorial view. Although candidates were required to use free-hand or ruler-assisted sketches to produce the required pictorial view a few of them deviated by using computer-aided drafting software to do so. This was an anomaly to the normal practice. Most candidates were able to show two or more dimensions on their drawings.

Although there was marked improvement in drawing skills, some candidates did not appear to have been adequately exposed to all aspects of drawing and design principles and especially the fundamentals of lines, dimensioning, sketching techniques, types of material symbols and pictorial drawing. Candidates need to be adequately exposed to good comprehension and interpretive skills if they are to do well on questions prepared from the Drawing and Design module of the syllabus.

For Part (b) of the question, candidates were required to state the most suitable wood joints to be used for each of the sections labelled C, D, E and F in Figure 1. This question was designed to test candidates' knowledge of joints used for cabinet work.

The responses provided by most candidates were generally unsatisfactory. The selection of suitable types of joints presented challenges for candidates. The need for candidates to be closely coached in the knowledge and understanding of the subject content is critical to their becoming proficient. In addition, the need for quality time to be spent honing their drawing skills to produce suitable sketches of various wood work components in both pictorial and orthographic forms cannot be over-emphasized.

Part (c) had two subsections, (c) (i) and (ii). In Part (c) (i), candidates were asked to state two types of suitable solid timber materials that might be used to make the frame of the desk and bookcase. This question was designed to test candidates' knowledge of the types of solid timber that could be used in cabinet making. This part of the question was generally well done. Only a small number of candidates could not distinguish between solid timber and manufactured board. In Part (c) (ii), the candidates were asked to state two types of suitable manufactured boards that could be used to make both the desktop and the bookcase. This question was designed to test candidates' knowledge of manufactured boards used in cabinet making. Most candidates were able to provide at least one suitable material for the covering, while others supplied materials that were eccentric to standard practices in the field.

Part (d) required candidates to name two methods that could be used to fix the table to the frame. For Part (d) (ii), most candidates provided appropriate fasteners. However, there were cases where candidates provided unrelated sketches to aid their responses. Therefore, they could not obtain maximum marks.

Part (e) required candidates to state how the back of the bookcase could be designed to prevent the books from falling off. This question was designed to test the candidates' knowledge of the type of materials used for the backing in cabinet making. This part of the question was popular.

Part (f) required the candidates to use a table to create a bill of quantities. Candidates were required to write, in correct order, the most important headings for each of the columns labelled A, B and C. The candidates demonstrated difficulty in completing the bill of quantities.

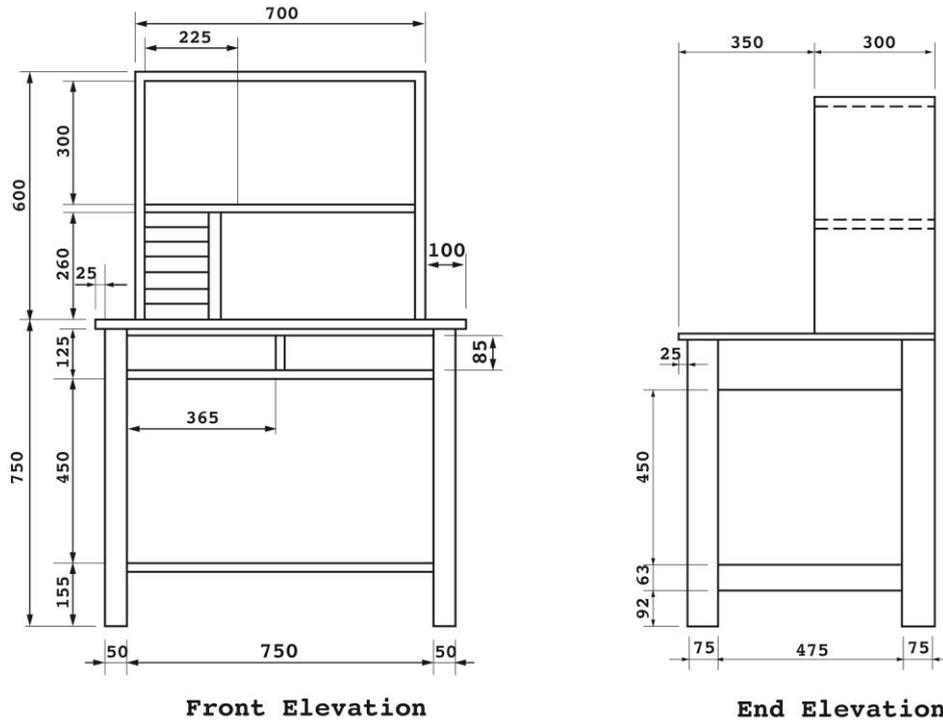
Recommendations

- All Building Technology (Woods) students must be encouraged to pursue Technical Drawing to enhance their drawing skills.
- Question 1, both the written part and the drawing, should be done solely on the drawing paper supplied.

The expected responses to Question 1 are as follows:

- (a) (i) and (ii). Candidates had to use the orthographic projection method to produce neat, proportional and ruler-assisted sketches of the front and the side views labelled 'A' and 'B' respectively of the re-designed combined desk and bookcase. Examples are shown below.

(b)



(iii) The names of the views are front elevation and side elevation.

(iv) Types of lines generally used for detailed working drawings include, but are not limited to:

- Break lines
- Extension lines
- Object lines
- Hidden lines
- Construction lines
- Centre lines
- Dimension lines

(b) The most suitable wood joints for:

C – mitre, butt, rebate

D – stopped housing joint, dowel joint

E – lapped dovetail

F – bare faced mortice and tenon, mortice and tenon, dowel

(c) (i) Two types of suitable solid timber materials that may be used to make the frame for the desk and bookcase include, but are not limited to:

- Pine
- Mahoe
- Cedar
- Poplar
- Greenheart
- Mahogany

- (ii) Two types of suitable manufactured boards that can be used to make both the desktop and the bookcase include, but are not limited to:

Chipboard
Medium density fibreboard (MDF)
Plywood
Blockboard

- (d) Two methods that can be used to fix the table top to the frame include, but are not limited to:

Pocket screwing
Screw and angle plate
Screw and glue block
Screw block in a groove
Screw plate in a groove

- (e) The back of the shelf should be supported with a thin, 3–6 mm plywood, hardboard or other suitable materials.

- (f) The most important headings for a bill of quantities for materials are found in the table below.

A- Quantity/amount required	B- Description of items	C- Sizes

Section B

Candidates were required to answer three questions from this section of the paper. Each question was worth 20 marks.

Question 2

This question assessed candidates' knowledge and application of skills related to sub-module C 6.1 'Materials', of the syllabus. This was one of the most popular of the optional questions in this section and was attempted by 64 per cent of candidates. Candidates' responses to this question were generally satisfactory.

In Part (a) candidates were required to list four advantages that manufactured boards have over solid wood. This question was designed to test the candidates' knowledge of advantages of manufactured boards over solid wood. Most candidates who responded to this part of the question provided appropriate responses.

Part (b), had two sub-parts, (i) and (ii). In (b) (i) candidates were asked to state two advantages and one disadvantage of kiln seasoning, and in Part (b) (ii), candidates were asked to state two advantages and one disadvantage of air seasoning.

Part (c) had two sub-parts; (i) and (ii). For (c) (i) candidates were asked to sketch one type of seasoning defect and for (c) (ii) one type of growth defect. This question was designed to test candidates' application skills by requiring them to produce illustrative sketches of different types of wood defects.

In Part (d), candidates were asked to use suitably labelled sketches to show two timber conversion methods from the following list: (i) quarter sawing, (ii) plain sawing/through and through sawing and (iii) tangential or back sawing. This question was designed to test the candidates' application skills by producing illustrative sketches of different methods of conversion.

The responses were for the most part satisfactory. The part of the question that was widely known was Part (d), while Part (a) of the question presented the greatest challenge to candidates. Many candidates were unable to list four advantages that manufactured boards have over solid boards.

Recommendations. There should be more focus on the advantages and disadvantages of manufactured boards and the methods of seasoning timber and the identification of timber defects should be reinforced.

The mean score for this question was approximately 8 marks, with five candidates gaining full marks. Fifty-one per cent of candidates who attempted this question scored in the range of 8–20 marks.

The expected responses to Question 2 are given below.

(a) Four advantages that manufactured boards have over solid timber include but are not limited to:

- They can be obtained in larger sizes.
- They possess high uniform strength.
- They are free from shrinkage, swelling and warping.
- They can be safely nailed or screwed near the end without splitting.
- They are more economical.
- They can be worked and cut to size easily

(b) (i) Two advantages of kiln seasoning include but are not limited to:

- The drying time is shorter.
- Staining is unlikely to take place.
- Timber is not left exposed to fungi and insect attack.
- Moisture content of timber can be controlled.

One disadvantage of kiln seasoning is:

- Case hardening can occur.
- It is a more expensive process.

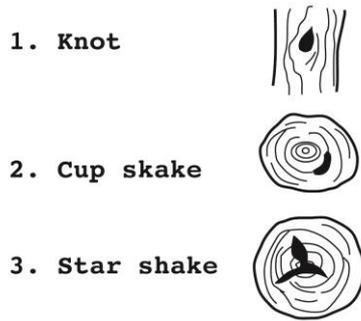
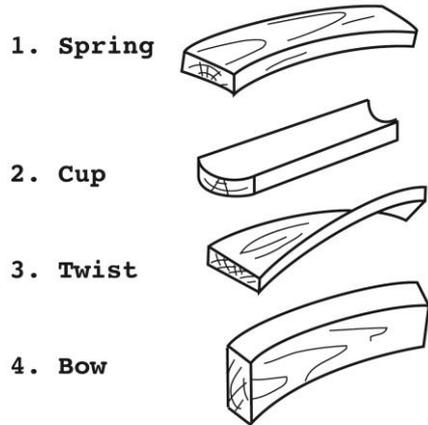
(ii) Two advantages of air seasoning include but are not limited to:

- Surface checks are minimized.
- Collapse and case hardening are minimized.
- The process is cheaper.

One disadvantage of air seasoning includes:

- Timber is left exposed to the fungi and insect attack.
- The drying time is much longer.

(c) Sketches to show one type of seasoning/growth defect:



(d) Two labelled sketches showing timber conversion.



Question 3

This question was designed to test candidates' knowledge and application of principles relating to the use and care of chisels. It also sought to test understanding of how a chisel is reconditioned. This question was attempted by 42 per cent of candidates, of whom 22 per cent provided satisfactory responses. The mean score on this question was 4.5, with no candidate earning full marks. Twenty-two per cent of candidates who attempted this question scored in the range of 8–20 marks.

Part (a) consisted of two sub-parts, (i) and (ii). The candidates were asked to state two specific uses for (i) a bevelled edge chisel and (ii) a mortice chisel. For Part (b) the candidates had to list, in sequential order, three steps to be followed to recondition a chipped edge on the wood chisel shown in Figure 2.

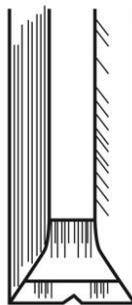


Figure 2. Chisel with chipped edge

Part (c) required candidates to use neat sketches to show the difference between (i) a grinding angle and (ii) a sharpening angle. Part (d) required sketches to show two appropriate ways to use the entire surface of the oilstone when reconditioning the chisel shown in Figure 2 to achieve the sharpness required.

Question 3 was an optional question. The responses were for the most part satisfactory. Part 3 (a) (ii) was the most widely known. Candidates showed that they were experienced in the use of the mortice chisel. However, Part (b) posed the most difficulty to the candidates. The responses given revealed that they had very little experience in re-conditioning chisels. It is believed that this area is not widely taught. Attention is drawn to section C2.2:7 of the syllabus which points out that candidates have to be able to maintain and sharpen edge tools.

Recommendations

Teachers need to emphasize comprehension and interpretation skills in dealing with questions. They should also use best practices.

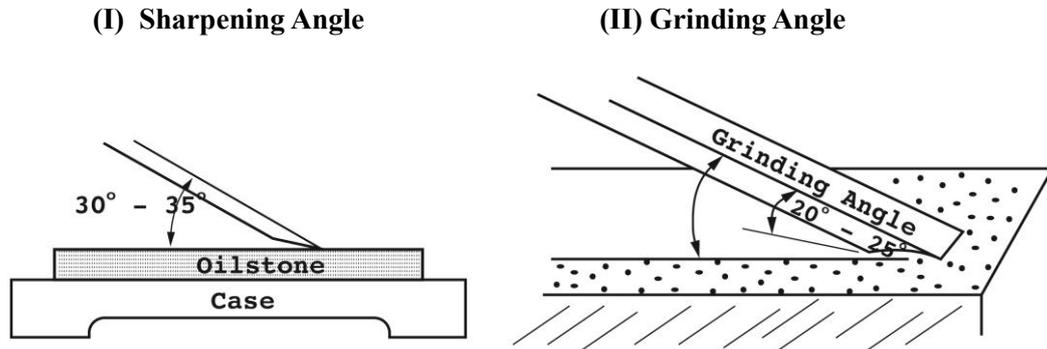
Expected responses for this question are given below.

- (a) (i) Two specific uses of the bevelled edge chisel:
- Paring
 - Light chiselling, such as preparing recesses for hinges
 - Cleaning out corners of joints (dovetail)
- (ii) Two specific uses of the mortice chisel:
- Heavy chiselling
 - Deep work
 - Cutting and digging mortices

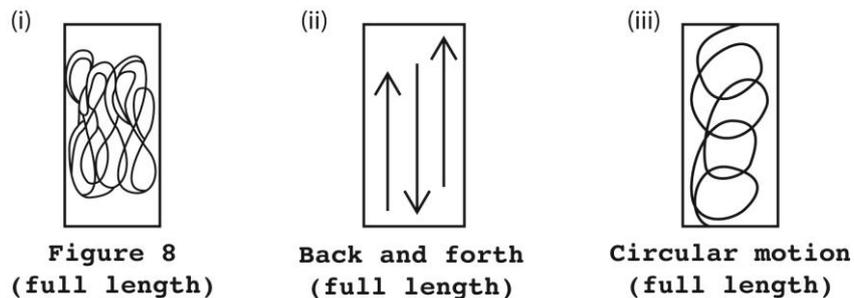
(b) Three steps that should be followed to remove the chipped edge on a wood chisel as shown in Figure 2:

- Grind the chipped edge on a bench grinding machine.
- Grind the square edge of the chisel to the required angle.
- Sharpen/hone the bevel to the correct angle to establish the cutting edge.

(c) Sketches to show the difference between (i) grinding angle and (ii) sharpening angle:



(d) Illustrative sketches of correct ways to use the oil stone:



Question 4

This question assessed candidates' knowledge and application of skills related to Module C5, Finishes. Seventy-eight per cent of the candidates attempted this question. The mean score for this question was 7.0, with one candidate achieving full marks. Forty-seven per cent of candidates scored in the range of 8–20 marks. The question was divided into five parts.

Part (a) required candidates to suggest two suitable types of finishing materials that could be used to protect a picnic table made of timber from exposure to weather conditions. In part (b), candidates were asked to list three techniques that could be used to apply finishes to wooden furniture. Part (c) required the candidates to name two types of wood stains, while Part (d) required candidates to state three reasons for staining a piece of furniture. Part (e) asked candidates to explain, in sequential order, how finishing materials, namely sealer, wood filler, shellac and sand paper, would be used on a bookstand.

This was an optional question. The part that was widely known to the candidates was Part (a). The candidates showed that they knew characteristics of finishes. However, the part that posed the most difficulty to candidates was Part (c) as most candidates were unable to name two types of wood stains.

The responses expected from candidates are given below.

- (a) Two suitable types of finishing materials that could be used to protect the timber from exposure to weather conditions include, but are not limited to:
- Oil-based paint
 - Spar varnish
 - Teak oil
 - Tung
 - Linseed oil
- (b) Three techniques that can be used to apply finishes to furniture include, but are not limited to:
- Brushing manually
 - Spraying using spray gun
 - Roller application
 - Rubbed on
- (c) Any two of the following types of wood stains:
- Water stain
 - Oil stain
 - Chemical stain
 - Spirit stain
- (d) Any three reasons for staining a piece of furniture:
- To bring all parts of the furniture to a uniform colour
 - To imitate more expensive woods
 - To colour a job to match other articles of furniture
 - To change the colour of timber to show off its grain pattern

The sequential order in which each finishing material is used:

- (i) The **wood filler** would be used first to cover all indentations and blemishes caused by loose knots and nail holes.
- (ii) A coat of **shellac** (knotting compound) will be used to treat all knots to prevent resin from bleeding through the wood pores.
- (iii) **Sanding** properly, using appropriate grade abrasive paper to produce a smooth finish.
- (iv) A coat of **sealer** will then be applied to seal the pores of the wood surface.
- (v) **Sanding** will be applied, using finish grade sandpaper prior to the application of the final finishing material.

Question 5

This question tested candidates' knowledge of the principles, safety and skills involved in using stationary woodworking equipment as described in Module C3 – Machine Operation. The question was divided into five parts, (a), (b), (c), (d) and (e). This question was attempted by 51 per cent of candidates, 39 per cent of whom provided satisfactory responses. The mean score was 6.6, with no candidate achieving full marks. Thirty-nine per cent of candidates scored in the range of 8–20 marks.

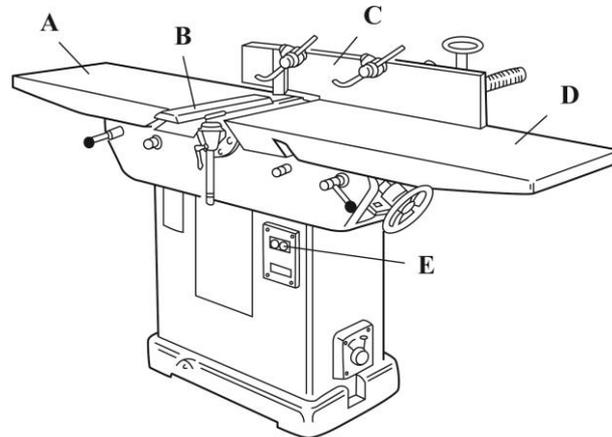


Figure 3. Stationary jointer

In Part (a) the candidates were required to label parts identified on the jointer. For Part (b) the candidates were asked to list three cutting operations that could be performed on the jointer. For Part (c) the candidates were asked to list three factors which determined the quality of finish to be achieved when planing on the jointer. Part (d) focused on the correct way to position one's hands when operating the jointer during the start of the cut, half-way through the cut and when completing the cut. Part (e) required the candidates to use a suitable sectional sketch to show the depth of cut made on the edge of a piece of timber as it makes one pass over the cutter head of the jointer.

This question was optional. The responses were for the most part satisfactory. The parts of the question which were widely known were Parts (a) and (b). The part of the question that presented most difficulty to candidates was (e).

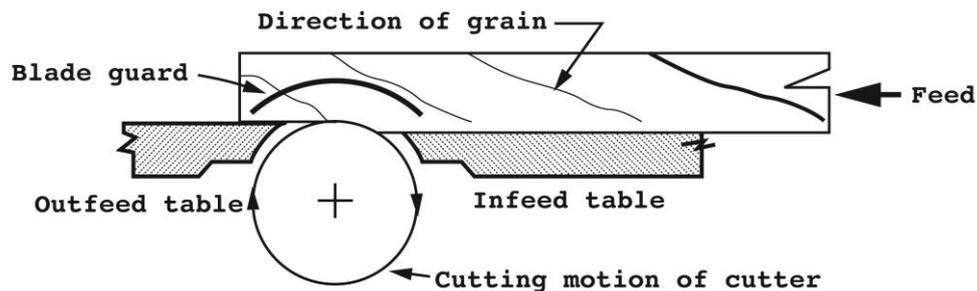
Recommendations

Candidates need to be engaged in the hands-on or practical use of the jointer and machines in general in the workshop. Therefore, school workshops must be equipped with these.

Expected responses to this question include but are not limited to the following:

- (a) Parts of the jointer labelled A, B, C, D and E as shown in Figure 3
- A – Out-feed table
 - B – Telescopic guard
 - C - Fence
 - D – In-feed table
 - E – Off/On switch
- (b) Any three of these cutting operations that can be performed on the jointer:
- Surfacing
 - Edging
 - Chamfering
 - Bevelling
 - Tapering
 - Rebating

- (c) Any three factors which determine the quality of the finish to be achieved when planing on the jointer:
- The diameter of the cutter
 - Sharpness of the cutting knives
 - The speed at which the stock is fed
 - The revolutions per minute of cutter head
 - Quality of materials
- (d) The correct way to position one's hands when operating the jointer:
- At the start of the cut.** Both hands should be used to press the board or stock firmly on the table when feeding to ensure consistency during planing or surfacing.
 - Half-way through the cut.** When the board has moved 150 mm past the cutter, the left hand should be placed carefully on the stock to press it down on the out-feed table. The right hand should be used to keep the stock firmly pressed down on the in-feed table to continue the cut.
 - Completing the cut.** The right hand should then be used with a push block to complete the process.
- (e) Sectional sketch to show the depth of cut made on the edge of a piece of timber as it makes one pass over the cutter head of the jointer.



Question 6

This question was based on sub-module C6.2 relating to Ironmongery. This question tested candidates' knowledge and application of the principles and processes involved in laying out where drawer ironmongery should be located and the steps involved in correctly installing hinges on a bedside cabinet door. The question was attempted by approximately 31 per cent of the candidates, of whom 47 per cent provided satisfactory responses. The mean score for this question was 7.2, with no candidate gaining full marks. Thirty-one per cent of candidates scored in the range of 8–20 marks.

In Part (a), candidates were asked to name the ironmongery labelled A, B, C and D shown in Figure 4.

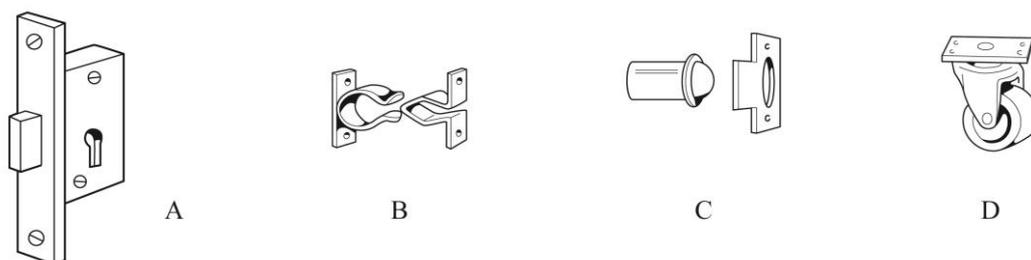


Figure 4. Types of ironmongery

For Part (b), they were asked to state the type of ironmongery most suitable for use in attaching a wooden gate to a picket fence to enclose an outdoor garden and ironmongery used for securing/fixing one of the doors in position.

Part (c) required candidates to give one reason for selecting the type of ironmongery in each situation in (b).

For Part (d), candidates were asked to name two materials suitable for making ironmongery that could be exposed to climatic conditions.

In Part (e) (i) candidates were required to use sketches to assist with explaining two layout processes that should be used to locate the hole indicated by the centre line shown in Figure 5 and in (e) (ii) to explain, in sequential order, three steps to be taken to correctly install a pair of hinges to the bedside cabinet door.

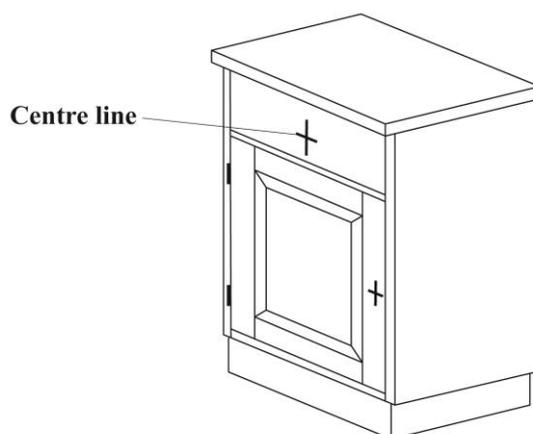


Figure 5. Bedside cabinet

This was an optional question. The responses were for the most part satisfactory. The best responses were provided in (a). In this part, candidates readily named the different types of ironmongery shown. The part of the question that posed the most difficulty was (b) (ii). Candidates were unable to satisfactorily name ironmongery used to secure doors. Teachers need to pay more attention to the specific use of ironmongery and where they are used.

The responses expected from candidates are given below.

(a) Ironmongery labelled A, B, C and D, as shown in Figure 4.

- A – mortice cupboard lock
- B – spring catch
- C – ball catch
- D – castor wheel

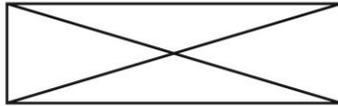
(b) The type of ironmongery most suitable for use in (i) attaching a wooden gate to a picket fence to enclose an outdoor garden and (ii) securing/fixing for each type:

- (i) Tee hinge
- (ii) Bolts – tower or barrel type

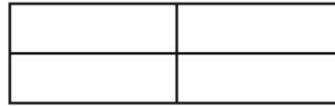
(c) One reason for selecting each type of ironmongery in Part (b):

- Tee hinge provides good leverage for long gates.
- Bolts provide security and restraint.

- (d) Two materials suitable for making ironmongery that could be exposed to climatic conditions:
- (i) Brass
 - (ii) Stainless steel
 - (iii) Plastic
 - (iv) Aluminium
- (e) (i) Two layout processes that should be used to locate the hole indicated by the centre line shown on the drawer in Figure 5.



Using diagonal lines



Measuring half width and length

- (ii) Three steps in sequential order to be taken to correctly install a pair of hinges on the bedside cabinet door shown in Figure 5.
1. Position the hinges in line with the top and bottom rails.
 2. Mark the hinge length on the hanging stile edge and on the front face of the carcass.
 3. Gauge the hinge width and half its thickness between these lines. This defines the length, width and depth of the gain/recess in both the stile and the carcass.
 4. Use the chisel and mallet to cut out the gain or recess in both the stile and carcass.
 5. Place the hinges on the stile and fix in place with one screw each.
 6. Position and fit the hinges to the face of the carcass with one screw each.
 7. Test the fitting, make necessary adjustments then fix the remaining screw to complete the installation.

Section C

Candidates were required to answer one question from this section of the paper. Each question was worth 20 marks.

Question 7

This question tested candidates' knowledge and application skills related to sub-module C6.3 – Cabinet Making. The question was divided into four parts. Only 19 per cent of the candidates attempted this optional question. The mean score for this question was 6.5, with no candidate achieving full marks. Thirty-eight per cent of candidates who attempted this question gave satisfactory responses. In general, the question focused on cabinet construction methods and suitable materials and ironmongery for cabinet making.

In Part (a) candidates were asked to state three features of a framed carcass and a solid end carcass. Part (b) asked candidates to name two materials used for cabinet counter tops, while Part (c) asked candidates to name two types of ironmongery generally used for cabinet drawers.

In Part (d) candidates were required to produce a labelled exploded pictorial view to show the joint which is to be used at the corner of the parts labelled A and B in the given figure. They were also required to make a suitable sketch of the section labelled X–X on the given figure to show the method to be used to keep the glass secured in the framing of the cabinet door.

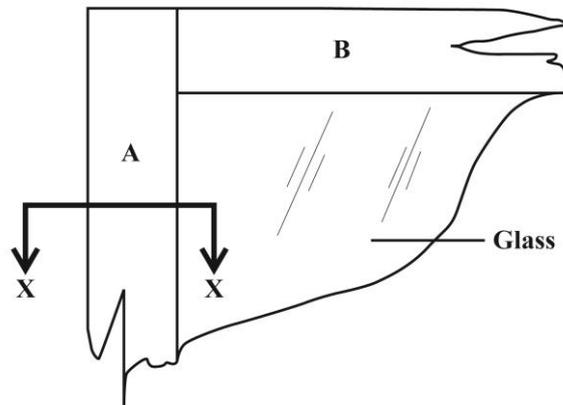


Figure 6. Partial elevation of a rebated cabinet door

The responses to this question were generally poor. The part of the question that was widely known was (b), where candidates easily named two materials that can be used for cabinet countertops. However, the part of the question that posed the most difficulty was (a). Candidates were unable to satisfactorily state three features of the two cabinet construction methods. In Part (d), candidates were unable to produce correct exploded pictorial views of the required joint. Their responses indicated lack of knowledge and skills in Technical Drawing. They should be exposed to Technical Drawing, since this is the communication means for subjects such as Building Technology.

The responses expected from candidates are given below.

Three features of (i) a framed carcass and (ii) a solid end carcass:

(a) (i) Framed carcass construction

- The frame has four corner joints faced with plywood to form a flush face.
- Inner edges of the frame may be rebated/grooved to receive plywood.
- The doors have grooves to enable panels to fit into the frame.

(ii) Solid end carcass construction

- It consists of sides; a top, a base and a back.
- The top is sometimes screwed to the top rails.
- Housed joints may be used if shelves are needed.

(b) Two materials that are used for cabinet counter tops:

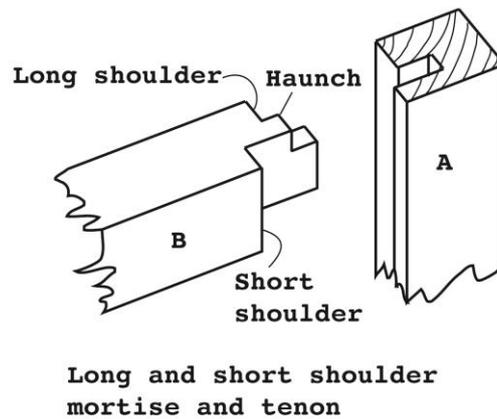
- Plywood
- Medium density fibreboard
- Glass
- Solid timber
- Granite
- Marble

(c) Two types of ironmongery that are generally used for cabinet drawers:

- Knobs
- Pulls/handles
- Mortice lock
- Drawer slides

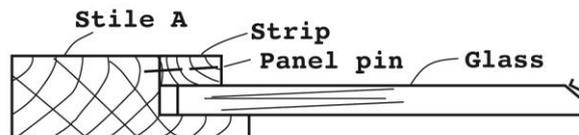
(d) Figure 6 shows the partial elevation of one corner of a rebated cabinet door.

(i) Sketch of exploded view



(ii) Sketch of section X - X

Sketch of section X - X



Question 8

This question was based sub-module C6.4, Household Furniture. This optional question was divided into two parts. This question was attempted by 37 per cent of candidates. The mean score for this question was 6.4, with no candidate achieving full marks. Three candidates scored 19 marks. Forty per cent of candidates who attempted this question gave satisfactory responses and scored in the range of 8–20 marks.

In Part (a), candidates were given a diagram of a pedestal stem for a small kitchen table with three identical legs. They were required to name three types of woodworking tools that might be used to cut the legs for the pedestal stand and list five steps to be followed to layout and cut the legs for the stand.

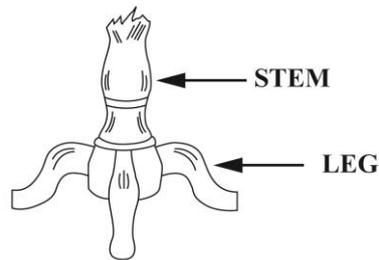


Figure 7. Stem of pedestal stand

For Part (b) (i), candidates were required to use neat, labelled sketches to show two different methods that could be used to join the legs to the stem of the pedestal stand. For Part (ii) the candidates were asked to name each of the joints produced in Part (b) (i), while for Part (b) (iii), the candidates had to briefly explain one method which might be used to layout the position of the joints for the three legs.

The responses were generally satisfactory. The part of the question that was most widely known was (b) (i). Candidates satisfactorily produced labelled sketches to show two different methods that could be used to join the legs to the stem of the pedestal. However, the part of the question that posed the most difficulty to candidates was (b) (iii). Generally, candidates found it challenging to explain one method which might be used to layout the position of the joints for the three legs. This might largely be due to limited exposure to the application of joints in various woodworking contexts. Candidates should have greater exposure to the practical application of joints.

The responses expected from candidates are given below.

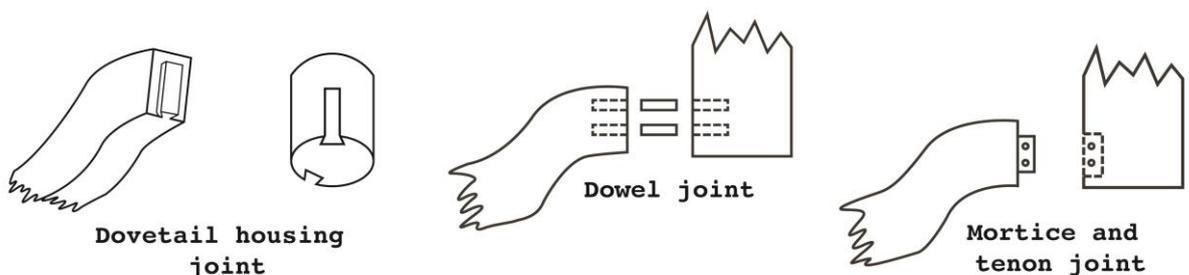
- (a) (i) Three types of woodworking tools that may be used to cut the legs for the pedestal stand:

1. Jigsaw
2. Band saw
3. Scroll saw

- (ii) Five steps to be followed to layout and cut the three legs for the stand:

1. Design the legs using free hand or drawing tools.
2. Make a template.
3. Layout design on stock.
4. Cut out the shape.
5. Use spokeshave or sander to reduce to finished size.

- (b) (i) Labelled sketches to show two different methods that can be used to join the legs to the stem of the pedestal stand:



(ii) Joints produced to join the legs to the stem of the pedestal:

- Dovetail housing joint
- Dowel joint
- Mortice and tenon joint

(iii) One method which may be used to layout the position of the joints for three legs:

- Secure the pedestal stem in a vertical position and use a protractor to divide the circumference of the stem into three equal parts of 120° (degrees). Then project line to the side with the aid of a square.

Question 9

This question tested candidates' knowledge of upholstery materials, tools and fabrication processes. It required candidates to demonstrate their knowledge of Module C4, Upholstery, with primary focus on sub-modules C4.1, Tools and Materials; C4.3, Webbing and C4.4, Padding and Covering. This optional question was divided into four parts. This question was attempted by 27 per cent of candidates. The mean score for this question was 8.5, with no candidate gaining full marks. Seven candidates scored 19 marks. Fifty-four per cent of candidates who attempted this question provided satisfactory responses and scored in the range of 8–20 marks.

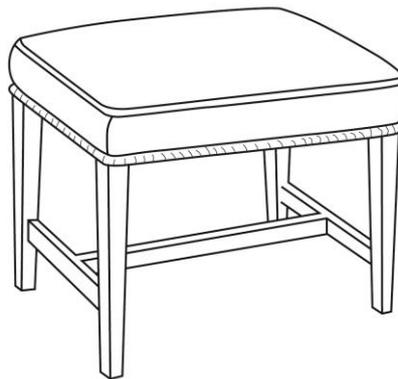


Figure 8. Pictorial drawing of upholstered stool

Candidates were given a pictorial drawing of an upholstered stool. In Part (a) candidates were asked to list four tools required to upholster the seat of the stool and to list four types of upholstery materials that may be used for creating the stool. Part (b) required the candidates to state two different methods that could be used to provide support to the drop-on/removable seat. Part (c) required the candidates to explain clearly, using three given major stages, how to restore the defective chair seat as shown in the figure.

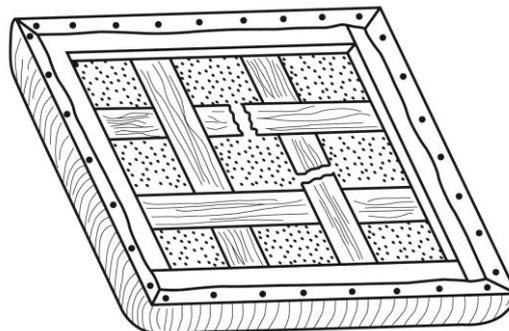


Figure 9. Defective chair seat

In Part (d), candidates were required to explain why webbing should be arranged in a laced formation and to explain how webbing should be stretched and tacked to the frame.

The responses to this question were generally satisfactory. The part of the question which was most widely known was (d) (ii). Candidates were able to explain why the webbing should be stretched and tacked to the frame. However, the part of the question which posed the most difficulty was (b). Candidates were unable to give two methods that can be used to support the drop-on/removable seat. Responses indicated that candidates had little or no exposure to methods used to support drop-in or removable seats, even though they may be exposed to them in everyday living activities.

Teachers should prepare projects that will enable students to gain hands-on practice of upholstering principles and techniques. In addition, field trips to upholstery furniture factories and workshops should be arranged. This approach will assist students to better appreciate the theory covered during classroom instruction. In general, teachers should utilize all possible learning opportunities that will advance the learning capabilities of their students.

The responses expected from candidates are given below.

- (a) (i) Any four of these upholstering tools required to upholster the seat of the stool:
- Foam cutter
 - Upholsterer's hammer
 - Stapling gun
 - Sewing machine
 - Cushion-filling machine
 - Hot ring and hot ring plier
 - Needle
 - Scissors
- (ii) Any four of these upholstering materials that may be used for creating the seat:
- Fabric covering – leather or plastic
 - Foam – plastic or latex
 - Welts, piping
 - Burlap
 - Plywood base
- (b) Any two methods that can be used to provide support to the drop-on/removable seat:
- Using rebates on the rails
 - Using angle corner blocks
 - Using strips/battens
 - Using cleats
- (c) Three steps to restoring the defective chair seat as shown in Figure 9:
- (i) Stripping or removal of old material
- Remove the tacks or staples from the covering material and remove the stuffing (foam).
- (ii) Placing the new material
- Remove the damaged webbing material and replace it with new material. Re-stuff the seat with foam.

- (iii) The re-covering of the seat
 - Stretch and tack the covering material in correct places on the wood frame base.
- (d) (i) Explanation of why webbing should be arranged in a laced formation:
 - The webbing is placed in a laced formation to allow for even distribution of weight.
 - The arrangement of webbing also prevents unnecessary sagging.
- (ii) Explanation of how webbing should be stretched and tacked to the frame:
 - The webbing should be placed between 50–75 mm apart and stretched using a webbing stretcher to obtain the required tautness.

Paper 03–School-Based Assessment (SBA)

Rationale

The SBA component of the Building Technology (Woods) Option measured the practical skills not tested on the multiple choice and free response papers (Papers 01 and 02).

The assignments set for SBA were intended to deepen students' knowledge and help them achieve competency in skills required in the building/woodwork industry which are within the competence of secondary school students.

By focusing on processes as well as product, the SBA component was designed to allow students to demonstrate improvement in skills over a period of time and for their teachers' involvement in the process.

Requirements

Each student was required to complete a practical and a written assignment, during Terms 4 and 5 of the two-year course (Terms 1 and 2 of the examination year). The practical assignment is worth 90 marks and the written assignment is worth 30 marks.

Practical Assignment

For the practical assignment, students were required to construct a project designed to utilize the skills and knowledge covered in the syllabus. Students were given the option to choose one project from a list of three provided by CXC to meet pre-set requirements. All dimensions for the project were given in millimetres (mm) unless otherwise stated. The project was not to exceed the dimensions of 700 mm long x 400 mm wide x 400 mm deep. Dimensions omitted were left to the students' discretion.

Each student was expected to:

- Provide a plan sheet for the project which MUST include the following:
 - drawings and/or sketches
 - steps of procedure
 - a bill of materials
 - a list of tools and equipment to be used

- Construct a project

The particulars for the project had to be approved by the teacher prior to commencement.

Written Assignment

The written assignment took the form of a report of about 1000–1200 words based on the Common Module: Career Opportunities. Students were required to write on the topic set by CXC for each examination. The topic was based on the following themes in the module:

- Job search
- Career choice
- Industrial visits
- Profile of engineer or inventor

Students were assessed on accuracy of information, clarity of presentation, the use of technical language and knowledge of career opportunities in the building technology industry as outlined in the common module of the unit.

GENERAL RECOMMENDATIONS TO TEACHERS

General recommendations to teachers for previous years are repeated here mainly for those who are teaching the syllabus for the first time and for those who may not have seen them before. However, all teachers are encouraged to pay attention to the suggestions which follow in an effort to improve overall performance on the written examination and the SBA.

- Students must be encouraged to read the examination questions carefully and follow instructions precisely, as valuable time can be wasted on producing work that will not produce extra marks.
- All the modules of the syllabus for Option I, Woods, should be adequately covered during teaching. Teachers are cautioned against preparing students using mainly past papers. Examination questions are prepared to reflect the content of selected modules of the syllabus while the remaining modules should be covered to enable students to meet the requirements of their SBA projects. Therefore, the modules should be thoroughly taught to ensure that students are adequately prepared for the theoretical and practical aspects of the assessment as well as for lifelong learning.
- Students must be encouraged to take both aspects of the SBA (the written assignment and the practical projects) very seriously as the SBA accounts for a very large portion of the overall marks in the Building Technology examination. For more information on the importance of this aspect of the examination, see pages 8–9 of the amendments to the syllabus in Industrial Technology which are placed at the back of the Industrial Technology syllabus of May/June 2002.
- Students should be given opportunities to produce more detailed sectional sketches so as to assist in improving their knowledge and understanding of vertical and horizontal sections of furniture components.
- Details and construction processes require serious attention. In this regard, it is suggested that teaching aids (models, videos and charts) be used in the laboratories/workshops where applicable to depict different approaches related to specific modules of the syllabus that have complex processes.
- The use of instructional tools such as videos and other electronic media are excellent teaching aids that should be explored and used to complement or supplement the unavailability of resources in workshops.

- Where possible, field trips to furniture manufacturing plants, factories, well-equipped schools and higher level institutions should be organized by teachers to ensure that students are adequately exposed to all woodwork machines indicated in the syllabus. In essence, this approach will help students to concretize the processes taught on the topic during classroom instruction.
- A number of students are experiencing varying levels of difficulty articulating their responses to the questions presented on the examination paper using Standard English. Common weaknesses include penmanship, spelling and use of the language among others. This problem needs to be more aggressively tackled by the schools' administration and all other stakeholders.
- Students should be constantly reminded that all sketches must be labelled where marks are awarded for labelling.
- Particular attention should be paid to Question 1 in Paper 02. This question is worth 40 marks and usually requires candidates to produce a number of detailed sketches. Candidates who are not skilled at sketching are likely to find this question very challenging. Teachers are therefore encouraged to provide students with adequate opportunities/activities to help them to develop their sketching skills. Since scale drawing is no longer required, candidates must note that well-proportioned sketches should be produced. In addition, candidates must acquire a good knowledge of furniture fabrication processes in order to perform well on the question.

NOTE: Always remind students that only Question 1 should be done on the drawing paper provided for the examination. All other questions must be done in the answer booklet.

- Where sections of the syllabus prove to be beyond the delivery capabilities of the teacher, it is suggested that he/she solicit the help of other subject experts. NOTE: This is especially important when the section contains hands-on practical work which may not be applicable in the workshop.
- The *five* steps of the *design process* are being suggested for consideration and application to assist in guiding the teaching/learning experience for product development. This is a technique that is driven by research and development and is widely used in most design and manufacturing industries globally. The five steps are arranged in a systematic way in order to assist students to plan, organize, fabricate and evaluate products such as household furniture and other items. This knowledge will provide students with a good understanding of, and an appreciation for the major processes that manufactured items have to undergo in order to achieve quality assurance.
- Candidates need to acquire competence in the knowledge and application of all woodworking machines, their operations, and the safety principles related to their use.
- Much emphasis should be placed on research work. Classroom instruction should be tailored to allow for more student-centred learning rather than the traditional teaching approach being used by some instructors.