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 2013

BUILDING TECHNOLOGY
TECHNICAL PROFICIENCY
OPTION I – WOODS

Copyright © 2013 Caribbean Examinations Council
St Michael, Barbados
All rights reserved.

GENERAL COMMENTS

The number of candidates who wrote the examination was 2 311, approximately 81 per cent of them earned Grades I–III. Candidates did quite well on the practical project of the School-Based Assessment (SBA) but some were weak 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 improved marginally above that of 2012. The mean score was 33.7 compared with 29.0 for 2012. The highest score attained by any one candidate was 56 compared with 50 for 2012. The lowest score attained was four.

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, Drawing and Design: Introduction to Drawing. This question is worth 40 marks.

Section B — This section comprises five questions based on Modules C2, C3, C5, C6.1 – Materials, and C2 – Ironmongery. Candidates were required to attempt three questions from this section.

Section C — This section had three questions based on Modules C4 – Upholstery, Modules 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 46.6 compared with 35.6 in 2012. The highest score attained on this paper was 111 compared with 99 for 2012, while the lowest score attained was zero.

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 either free-hand or ruler-assisted sketches of pictorial and orthographic views. It also required the analysis, design and/or selection of suitable materials and joints for furniture to be used for household purposes. Candidates were presented with an incomplete elevation of a storage cabinet. The length of the stand was given as 2000 mm, width 550 mm and height 850 mm, as shown in Figure 1. This question was worth 40 marks.

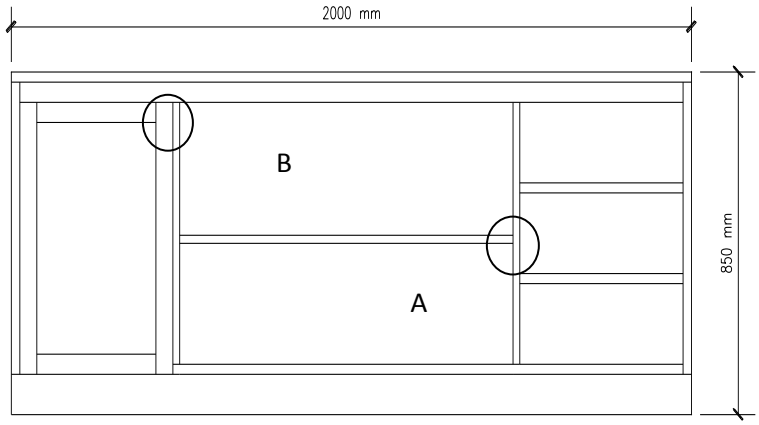


Figure 1. Elevation of incomplete storage cabinet

Part (a) required candidates to use a suitable labelled, free-hand or rule-assisted sketch to produce a pictorial view (either in oblique, isometric or perspective form) of the completed cabinet. The specific requirements for this drawing required that candidates include three drawers with handles and chamfered edges, a cupboard door with fixed glazing, handles positioned appropriately on the door and drawers, and four major dimensions.

A total of 91 per cent of the candidates attempted this compulsory question. Candidates' performance on this part of the question was much improved in comparison to previous years. Those who were well prepared illustrated 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. Furthermore, some of the candidates were not able to show the glazing symbol on their drawing solutions. Most candidates were able to show two or more dimensions on their drawings.

Although there are marked improvements in drawing skills, some students are still not being 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. Students 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 Parts (b) (i) and (ii) of the question, candidates were required to make neat illustrative sketches of joints to be used for points A and B as indicated in Figure 1 as well as name each of them. This question was designed to test candidates' knowledge of joints used for cabinet work. Candidates provided satisfactory responses for these parts of the question.

Part (b) (iii) required candidates to name two types of joints that could be used to obtain the width of the cabinet. The responses provided by most candidates were generally unsatisfactory. The selection of suitable types of widening 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.

In Part (c) candidates were asked to name two types of manufactured boards. This part of the question was generally well done. Only a small number of candidates could not distinguish between solid timber and manufactured board.

Part (d) had two sub-sections (d) (i) and (ii). Part (d) (i) asked candidates to state two materials that could be used to cover the back of the cupboard. 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. 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.

Parts (e) (i) to (iii) required candidates to name two suitable portable power tools, two hand tools, and two types of finishes respectively. This part of the question was popular. For Parts (i) and (ii), candidates were able to provide suitable responses for power tools and hand tools respectively. However, for Part (e) (iii) some candidates struggled to provide suitable finishing materials to be used for the top of the cabinet to achieve beautification and hygiene. Therefore, instructors are being encouraged to continue to improve the process of preparing projects that will encourage students to plan, organize and apply design and interpretation skills to improve their practical ability and competence in furniture and all related fabrications**.**

The mean score on this question was 21.3, with one candidate earning full marks. Seventy-six per cent of candidates earned marks ranging from 16 to 40 on the question. Five candidates scored zero.

The expected responses to Question 1 (a) to (e) are as follows.

Candidates had the option to use oblique, isometric or other suitable pictorial methods to produce a suitable sketch of the completed storage cabinet. A typical example is shown below.

(a) (i–vi)

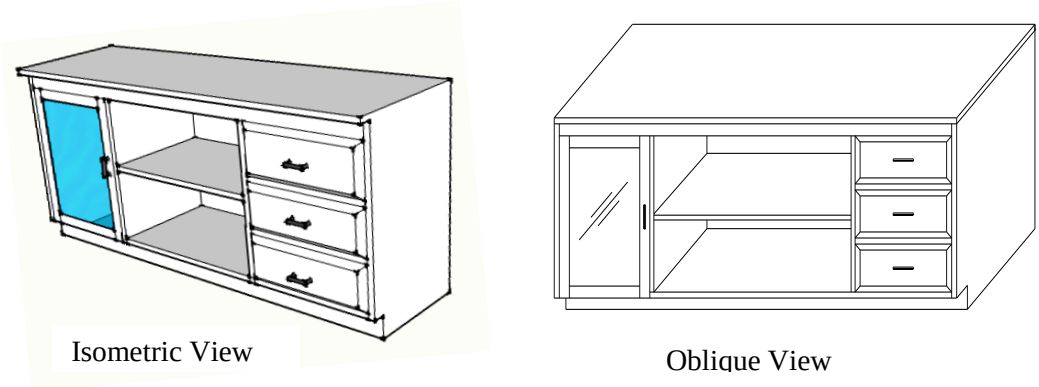


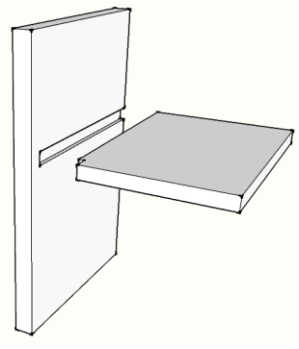
Figure 2. Pictorial drawing of the completed storage cabinet

(a) (vii) The dimensions should include any four of the following:

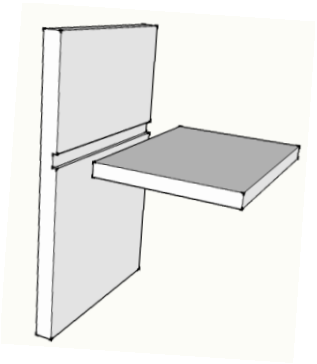
- Length — 2000 mm
- Overall height — 850 mm
- Width = 550 mm
- Thickness of top = 20–25 mm
- Width of cupboard 400–500 mm
- Height of cupboard = 620–700 mm
- Width of shelf = 700–1000 mm
- Height of shelves = 300–350 mm
- Width of drawers = 450–550 mm
- Height of drawers = 200–250 mm
- Baseboard = 75–100 mm

(b) (i–ii) Sketches and names of suitable joints for 'A' and 'B' respectively.

Part A

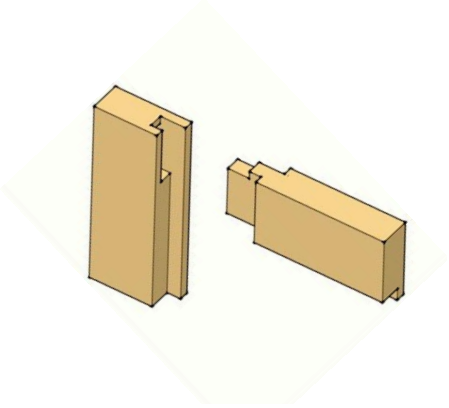


Stopped housing joint

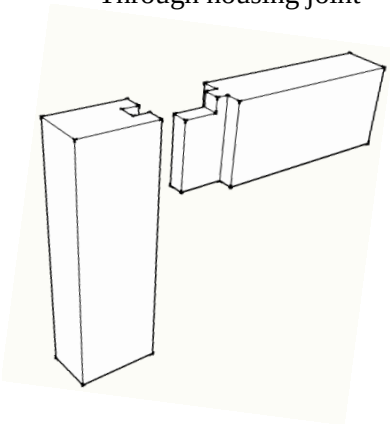


Through housing joint

Part B



Long and short shoulder mortise and tenon joint



Haunched mortise and tenon joint

Figure 3. Suitable joints for parts A and B

(b) (iii) Two suitable widening joints.

- Loose tongue and groove
- Dowel
- Rebate
- Spline
- Tongue and groove
- Slot and screw
- Feathered plough

(c) Two types of suitable manufactured boards.

- Plywood
- Medium density fibre board
- Blockboard
- Laminboard
- Particle board
- Fibreboard
- Other suitable manufactured boards

(d) (i) Two materials to cover the back of the cabinet:

- 3 mm plywood
- Hardboard
- Other suitable types are accepted

(ii) Two ways/means to secure the covering:

- Nails
- Screws
- Staples
- Glue

(e) (i) Two portable power tools:

- Router
- Belt sander
- Electric drill
- Planner
- Stapler
- Nail gun
- Jig saw
- Circular saw

(ii) Two hand tools:

- Try square
- Mallet
- Hand plane
- Mortise chisel
- Screw driver

(iii) Type of finishes:

- Varnish/Polyurethane
- Plastic laminate (Formica)
- Oil-based paint

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 Modules C2 and C5, Fasteners and Finishes, of the syllabus. This was the most popular of the optional questions in this section and was attempted by 72 per cent of the candidates. Candidates' responses to this question were generally satisfactory.

In Part (a) candidates were required to list four different types of fasteners that are used in furniture manufacturing. Most candidates who responded to this part of the question provided appropriate responses.

For (b), candidates were asked to describe, in sequence, five surface preparation processes for wooden furniture receiving a clear coat finish, while (c) asked them to state four reasons why these processes were significant. In general, the responses to this part of the question were satisfactory.

In Part (d) candidates were asked to list two ingredients that are used in the manufacture of paint. This part of the question was not satisfactorily done by candidates. Sound knowledge and understanding of the ingredients used in the manufacture of various types of finishes and their characteristics are fundamental to their use in furniture application.

The mean score for this question was 8.3, with no candidate gaining full marks. Fifty-nine per cent of candidates who attempted this question earned marks ranging from 8 to 19.

The expected responses to Question 2 (a) are given below.

(a) The four types of fasteners should include:

- Screws
- Nails/tacks
- Bolts
- Glue
- Staples
- Corrugated fasteners
- Dowels

(b) Five sequential processes for surface preparation:

- Remove loose knots and plug holes with wood pellets
- Punch nails below the surface of the furniture
- Use wood filler to cover all indentations and blemishes
- Sand properly using appropriate grade abrasive paper to produce a smooth finish
- Treat all knots with a coat of knotting compound (Shellac) to prevent resin from bleeding

(c) Four reasons for surface preparation:

- To remove marks made by tools
- To remove all scratches
- To remove indentations
- To create a surface that would ensure adhesion of the finishing materials
- To achieve uniformity when using timbers of different colours.

(d) Ingredients used in the manufacture of paint include but are not limited to:

- Pigment
- Dryer
- Solvent
- Vehicle

Question 3

This question was designed to test candidates' knowledge of suitable materials for furniture construction. It also sought to test their understanding of suitable materials for making fastening devices and the application of fasteners to join two pieces of materials. This question was attempted by 60 per cent of candidates, of whom 30 per cent provided satisfactory responses. The mean score on this question was 6.6, with three candidates earning full marks. Thirty-eight per cent of candidates who attempted this question scored between 8 and 20 marks.

Candidates' performance on Part (a) (i) was generally good. However, for Part (a) (ii), they experienced difficulty when trying to justify their choice of materials. Weak responses suggested that candidates were not familiar with the factors used for choosing appropriate materials for furniture construction.

Part (b) was divided into two parts. Part (b) (i) required candidates to name a suitable type of wood glue for use on outdoor furniture and give a reason for their choice. A number of candidates struggled to furnish a specific glue type to resist the elements and therefore could not provide a reason for its selection. Instead of identifying specific types of glues for the given situation, many candidates supplied generic names such as 'ponal' and 'gorilla' as types of glues. The glues should be identified by their properties and characteristics.

Part (b) (ii) required candidates to state two types of materials that are used to make screws for outdoor furniture and to give a reason for the selection of each material. While they were able to provide types of materials that could be considered to make the screws, they were not able to give pragmatic reasons for their choice.

Part (c) required candidates to use illustrative sketches to show the correct method for applying: (i) a countersunk head screw to secure a table top to a rail, (ii) dovetail nailing as opposed to screws, and (iii) a suitable joint to connect stool legs and rails. Candidates encountered some difficulty distinguishing between a dovetail joint and dovetail nailing. Teachers are encouraged to not only teach the theoretical aspect of the topics, but also the associated practical activities.

Expected responses for this question are given below.

(a) (i) Two suitable timber materials include but are not limited to:

- Purple heart
- Cedar
- Green heart
- Treated pine (WPP)
- Mahoe

(a) (ii) Reason for selecting the wood for outdoor use include but are not limited to:

- Weather resistance
- Insect resistance
- Density of the material (hardwood)
- Durability of the material

(b) (i) One suitable glue for outdoor furniture**:**

- Poly vinyl acetate (PVA)
- Epoxy resin

(b) (ii) Two suitable materials for screws include but are not limited to:

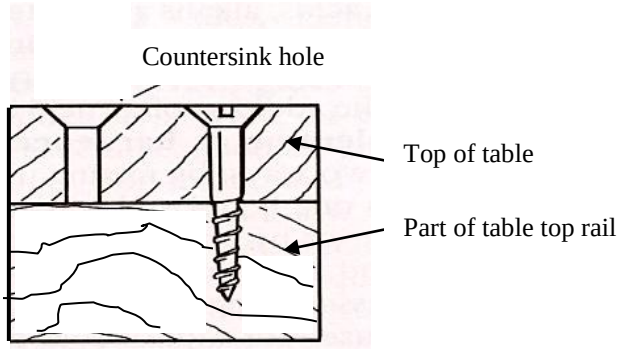
- Brass
- Stainless steel
- Copper, lead etc.

(b) (ii) Reasons for selecting material for each screw:

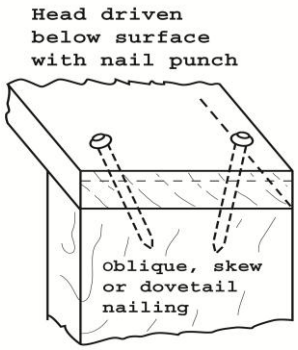
- Brass is corrosion resistant
- Stainless steel is strong and corrosion resistant

3 (c) (i–iii) Illustrative sketches:

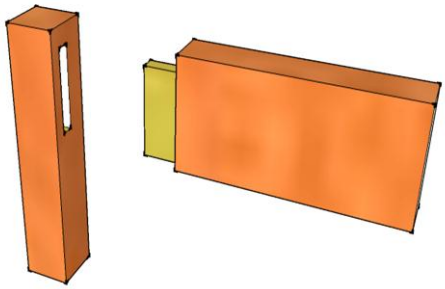
(i) Countersunk head screw application



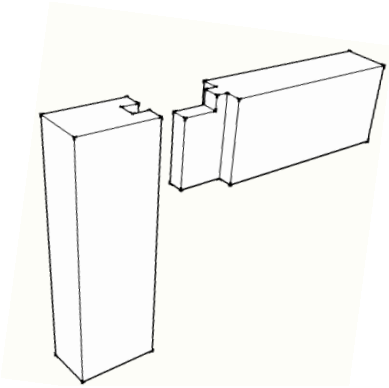
(ii) Dovetail nailing



(iii) Mortise and tenon joints



Stopped mortise & tenon joint



Haunched mortise & tenon joint

Question 4

This question assessed candidates' knowledge of sub-module C6.2, Ironmongery. This question tested candidates' knowledge and application of hinges that are used in furniture manufacturing. A total of 36 per cent of the candidates attempted this question. The mean score for this question was 8.0, with no candidate achieving full marks. Fifty-nine per cent of candidates scored marks ranging from 8 to 18. The question was divided into three parts.

Part (a) was further divided into four parts, (i–iv). This part of the question required candidates to state two uses each for four types of hinges, namely: (i) back flap, (ii) tee, (iii) cranked cabinet, and (iv) decorative hinge. The responses given by some of the candidates to Part (a) (i) were generally weak. This type of ironmongery appears to have been overlooked by some teachers. For Part (a) (iii), the responses from candidates indicated that they were very familiar with the uses for that type of hinge.

In Part (b), candidates were asked to name two tools that could be used to cut out the recess in frames to fit a pair of butt hinges. Candidates who responded to this part of the question provided satisfactory responses.

The final part of this question, Part (c), required candidates to explain the processes involved in fitting a pair of butt hinges to a cabinet door. Several candidates struggled to explain the processes in a sequential manner. In general, the responses seemed to indicate that greater emphasis needs to be placed on the application of various types of ironmongery through classroom instruction and lab practice.

The responses expected from candidates are given below:

(a) Two uses of each type of hinge:

i. Backflap hinge	–	used on the front of a writing desk
	–	used on the leaves of prop-leaf tables.
ii. Tee hinge	–	used on out buildings with garage doors and shed doors
	–	used on light gates
iii. Cranked cabinet hinge	–	used to enable door to be open free of the cabinet carcase
	–	to enable easy removal or repair of door
iv. Decorative hinge	–	used where high quality décor is required
	–	used on trinket boxes, chests, jewellery boxes

(b) Any two types of cutting hand tools:

- Tenon saw
- Bevelled-edge chisel
- Portable router
- Mallet

(c) Any five of the following sequential steps for fitting a pair of built hinges to a framed cabinet door accepted:

- Position the hinges in line with the top and bottom rails.
- Mark the hinge length on the hanging stile edge and on the front face of the carcase.
- Gauge the hinge width and half its thickness between these lines. This defines the length, width and depth of the gain desired.
- Use a chisel and mallet to cut out the recess in both the stile and the carcase.
- Fit the hinges to the stile and fix it in place with one screw each.
- Position and fit the hinges to the face of the carcase with one screw each.
- Test the fitting, make necessary adjustments then fix the remaining screws.

Question 5

This question tested candidates' knowledge and ability to apply the skills related to the use of stationary woodworking equipment as described in Module C3 — Machine Operation. This question was attempted by 64 per cent of the candidates, 39 per cent of whom provided satisfactory responses. The mean score was 6.7, with one candidate achieving full marks. The question was divided into two parts, (a) and (b).

Part (a) focused on safety principles related to the jointer and was divided into two sub-parts (a) (i) and (a) (ii). For Part (a) (i), candidates were asked to list five safety rules to be observed prior to using the jointer while Part (a) (ii) asked for a listing of safety practices to follow when using the jointer. These parts of the question were well known to candidates. However, the responses supplied by some candidates indicated a lack of thorough understanding of the safety rules governing the operation of the jointer.

For Part (b) candidates were asked to explain sequentially, five steps to be followed to cut a piece of stock to length using a stationary table/circular saw. The poor responses given by most candidates for this part of the question clearly indicates that they may not have been adequately exposed to the operation of this machine. The table saw is used to perform rip and cross cutting operations and is a stationary machine that is widely used in a woodwork shop.

Students should be adequately exposed to the theory and practice related to all stationary machines. Greater concentration on the planning and implementation of small and large scale projects, requiring the use of the table saw and other machines, is needed to ensure that students obtain full coverage of the application required.

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

(a) (i) Any five of the following safety rules accepted:

- Make sure that personal protective equipment is available.
- Make sure that push sticks and push blocks are available for use.
- Make sure that the machine is free from all clutter that could impede its performance.
- Ensure that the machine is turned off at the outlet prior to performing setting up activities.
- Check to ensure that cutters are in good working condition before use.
- Ensure that the blade, guard and fence are correctly positioned.

5 (a) (ii) Any five of the following safety rules accepted:

- Wear appropriate personal protective equipment.
- Assume an appropriate stance.
- Use push blocks/sticks as required.
- Wait until the blade achieves maximum speed before planning/jointing.
- Feed the stock slowly to the blade.
- Avoid passing your hands over the cutters during jointing activities.
- Never leave the jointer until the blade (cutters) comes to a full stop.

5 (b) Any five of the following sequential steps accepted:

- Measure and mark off the length of the stock with a square.
- Place the mitre gauge in the groove/slot on the table and adjust it to the correct angle.
- Adjust the height of the saw blade 1.5 to 3 mm above the thickness of the stock.
- Push the fence out of the way and position the stock on the table holding it firmly against the mitre gauge.
- Turn on the saw and allow it to reach maximum speed.
- Hold the stock firmly against the face of the mitre gauge and slide it to the blade to make the cut. This cut should be done on the waste side.
- Turn off the machine once the cut is completed and remove the stock only after the blade comes to a full stop.

Question 6

This question was generated from sub-module C2.3:1, Joint Construction. Candidates' knowledge and application of the principles to be applied to joint selection and construction were tested. The question was attempted by approximately 25 per cent of the candidates, of whom 60 per cent provided satisfactory responses. The mean score for this question was 9.41, with six candidates gaining full marks.

In Part (a) (i–iv) candidates were presented with the names of four types of joints and asked to make sketches of each type. For Part (b), they were asked to indicate the most appropriate use for each type. These parts of the question were attempted by most of the candidates, all of whom provided responses that were satisfactory.

Part (c) required candidates to illustrate the grain structure of wood converted using the through and through sawing method. This part of the question was not well done. It appears that candidates were exposed to the type of grain structure created by different conversion methods. In addition, diagrams showing conversion are usually illustrated to show the entire cross section of the log being cut. Candidates should become acquainted with the types of end grains produced by each conversion method.

For Part (d), candidates were asked to state two methods that are used to secure a mortise and tenon joint. This part of the question was satisfactorily done by students who attempted it.

Teachers should engage students in the production of sketches of various techniques and components related to woodwork. The use of varying, yet interesting, techniques should be integrated during classroom instruction to develop greater interest in the subject.

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 Module C6 — Furniture Construction. The question was divided into three parts. Only 24 per cent of the candidates attempted this optional question. The mean score for this question was 7.4, with five candidates achieving full marks. Forty-seven per cent of candidates who attempted this question gave satisfactory responses. In general, the question focused on the properties, production and application of manufactured boards.

In Part (a) candidates were asked to state five advantages of using plywood over solid timber. The candidates who attempted this part of the question provided satisfactory responses.

Part (b) required candidates to use a suitable sketch to show how the veneers of three layer plywood are arranged during manufacture. Most candidates were able to provide a suitable sketch in response to this part of the question.

For Part (c) candidates were asked to use sketches to show how the edge of plywood can be protected from peeling when it is used in the manufacture of doors and table tops. The responses to this part of the question were varied in that some of the candidates were able to show a level of understanding regarding how to treat the edges of the furniture while others struggled to correctly illustrate how this could be done to prevent peeling of the veneers.

Teachers should therefore explore a variety of techniques applicable for treating the edges of manufactured boards when used in furniture manufacturing. Students should also be assessed regularly, to determine their strengths and weaknesses in regard to the contents of the syllabus, and where required, remedial learning should be integrated. They should also be exposed to technical jargon so that when tested they can supply the required responses.

Question 8

This question was based on the objectives provided in sub-module C6.3 — Basic Cabinet Making. This question was attempted by 24 per cent of the candidates. The mean score for this question was 7.0, with no candidate achieving full marks. Forty-two per cent of candidates who attempted this question gave satisfactory responses. The question was divided into three parts. Part (c) contained two sub-parts.

Part (a) asked candidates to use notes and sketches to differentiate between carcase and cabinet construction. Candidates did not attempt this part of the question. Those who did were able to use sketches to differentiate between each type but experienced some level of difficulty giving the description in note form. Consequently, there were weaknesses in the written responses provided by candidates to this part of the question. Students should be taught how to decipher questions properly. For example, a question that uses a phrase such as "explain with aid of sketches" clearly requires that notes and sketches should be used when providing a response.

For Part (b) candidates were asked to name the parts labelled A, B, C and D on a given elevation showing a solid raised panel cupboard door. The responses from candidates who attempted this question were generally satisfactory. Candidates who were exposed to the construction of cupboards adequately named the parts while those who lacked this exposure supplied names that were ambiguous.

In Part (c) (i) candidates were asked to list three types of ironmongery to be used on the door. For Part (c) (ii), candidates were asked to list three tools that could be used to install the ironmongery they identified as being suitable. These parts of the question were satisfactorily answered by most candidates. However, a few candidates indicated fasteners such as screws and nails as types of ironmongery. It is imperative that students are instructed to distinguish between ironmongery and fasteners used in furniture construction.

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, and C4.4 — Padding and Covering. This question was attempted by 26 per cent of the candidates. The mean score for this question was 6.9, with no candidate gaining full marks. Forty-three per cent of the candidates who attempted this question provided satisfactory responses. The question was divided into three parts.

Part (a) required candidates to name five of the labelled parts of a given pictorial drawing of an upholstered stool. Candidates' responses to this part of the question were generally satisfactory.

For Part (b) candidates were required to explain briefly five processes to be followed to apply the covering material to the given stool. Candidates who were exposed to upholstering were able to respond satisfactorily to this part of the question. Others encountered difficulty in responding to this part of the question due to a lack of exposure to upholstery manufacturing processes.

Part (c) was focused on assessing candidates' knowledge of types of upholstery tools. This part of the question was generally well done. The responses indicated that candidates were exposed to the types of tools required for upholstery work.

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.

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 four and five of the two-year course (terms one and two 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 preset 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 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 students' 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 their cognitive and performance examinations 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 is placed at the back of the Industrial Technology syllabuses 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.

- Quite 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 school's 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. Additionally, 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 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 processes 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.